

# MDX-40

## SONY SERVICE MANUAL

*US Model  
Canadian Model  
AEP Model  
UK Model  
E Model*

### SUPPLEMENT-1

File this Supplement with the Service Manual.

#### Subject :

1. DISASSEMBLY
2. HOW TO BEND IN A ROTARY FLEXIBLE BOARD
3. TEST MODE
4. ELECTRICAL ADJUSTMENTS
5. EXPLANATION OF IC TERMINALS
6. BLOCK DIAGRAM
7. IC BLOCK DIAGRAMS
- CORRECTION

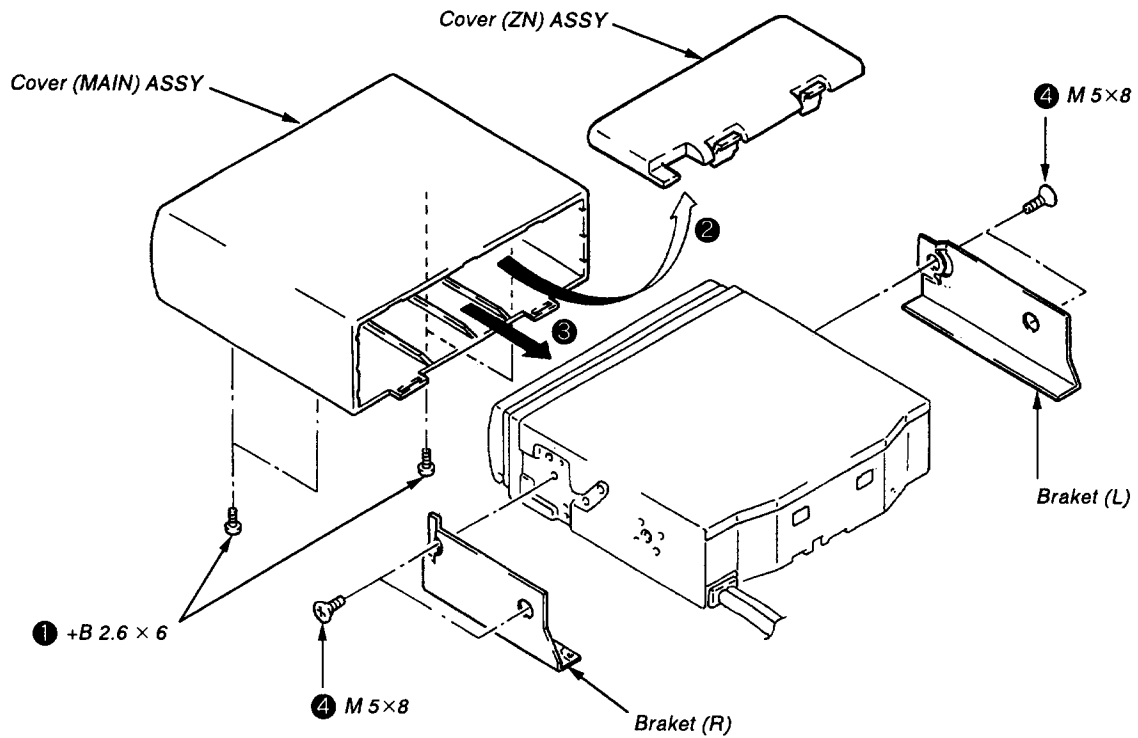
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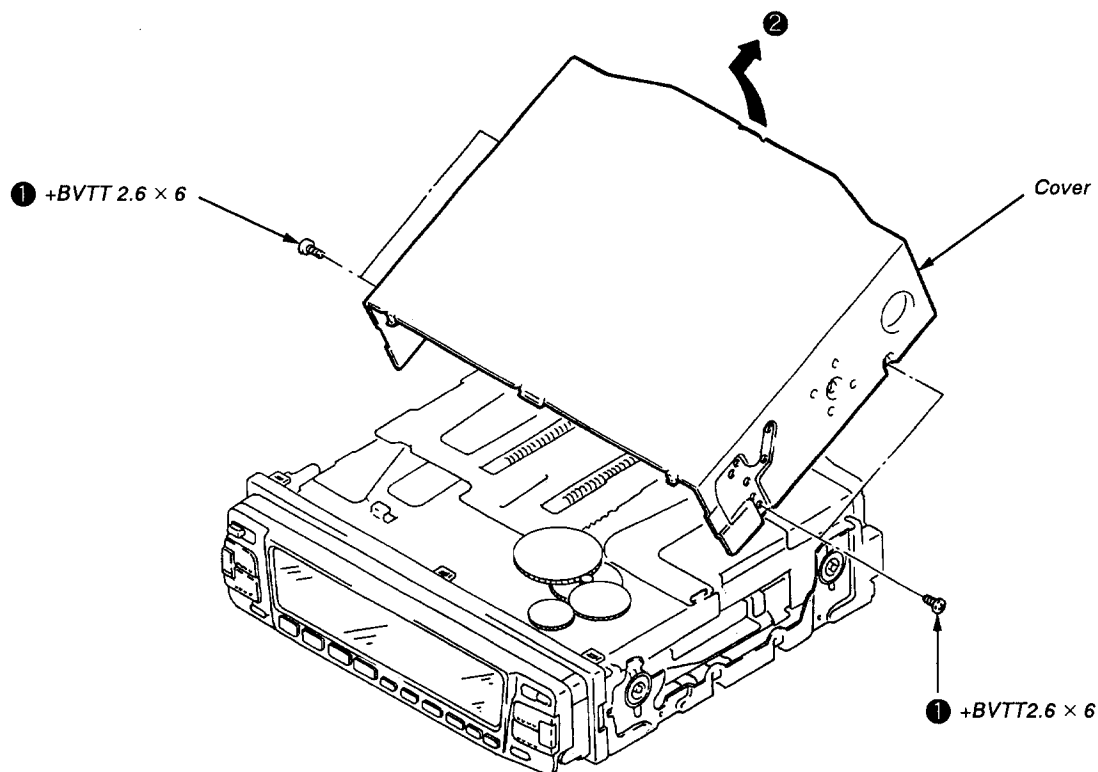
## SECTION 1 DISASSEMBLY

**Note :** Follow the disassembly procedure in the numerical order given.

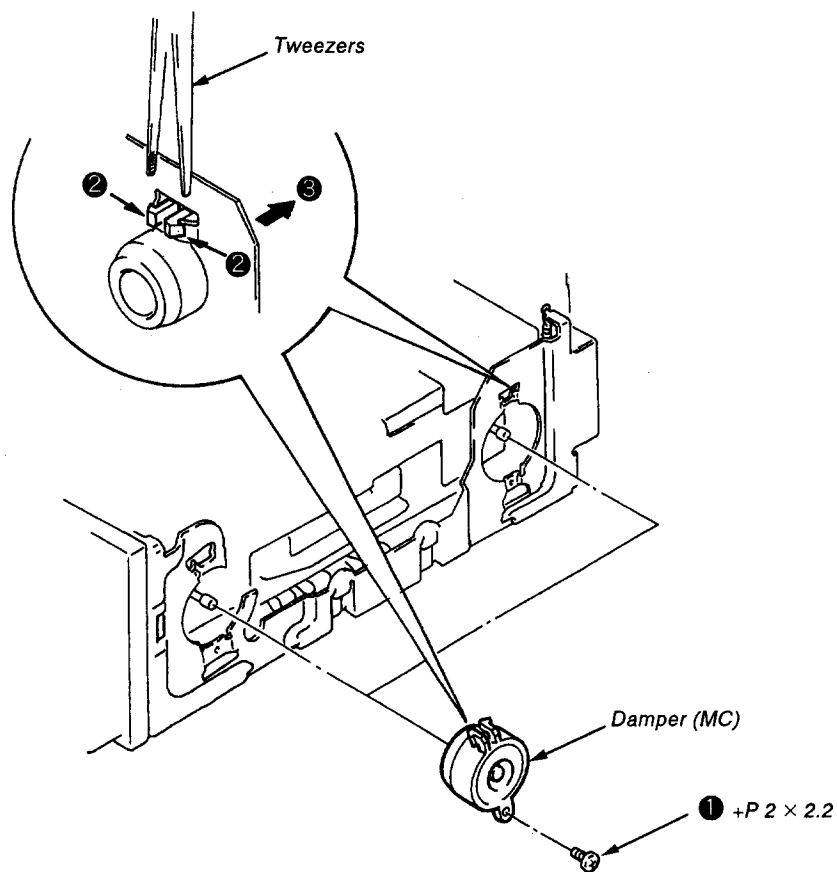
### 1-1. COVER (MAIN), BRACKET L/R



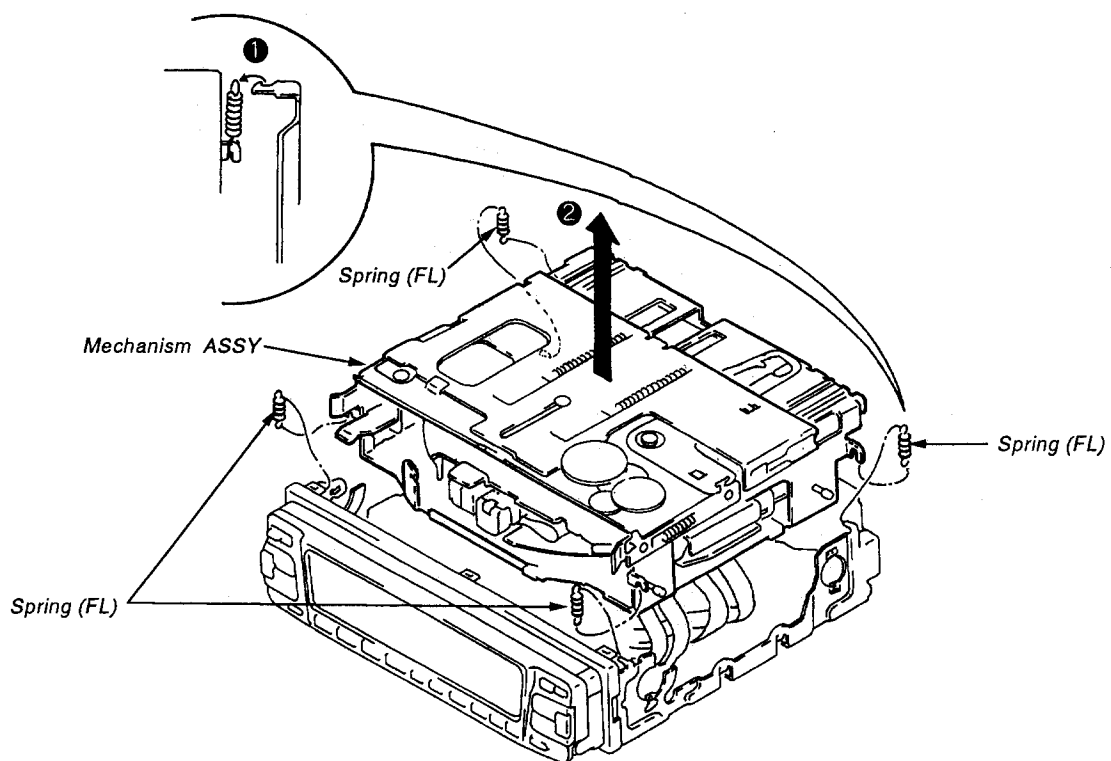
### 1-2. COVER ASSY



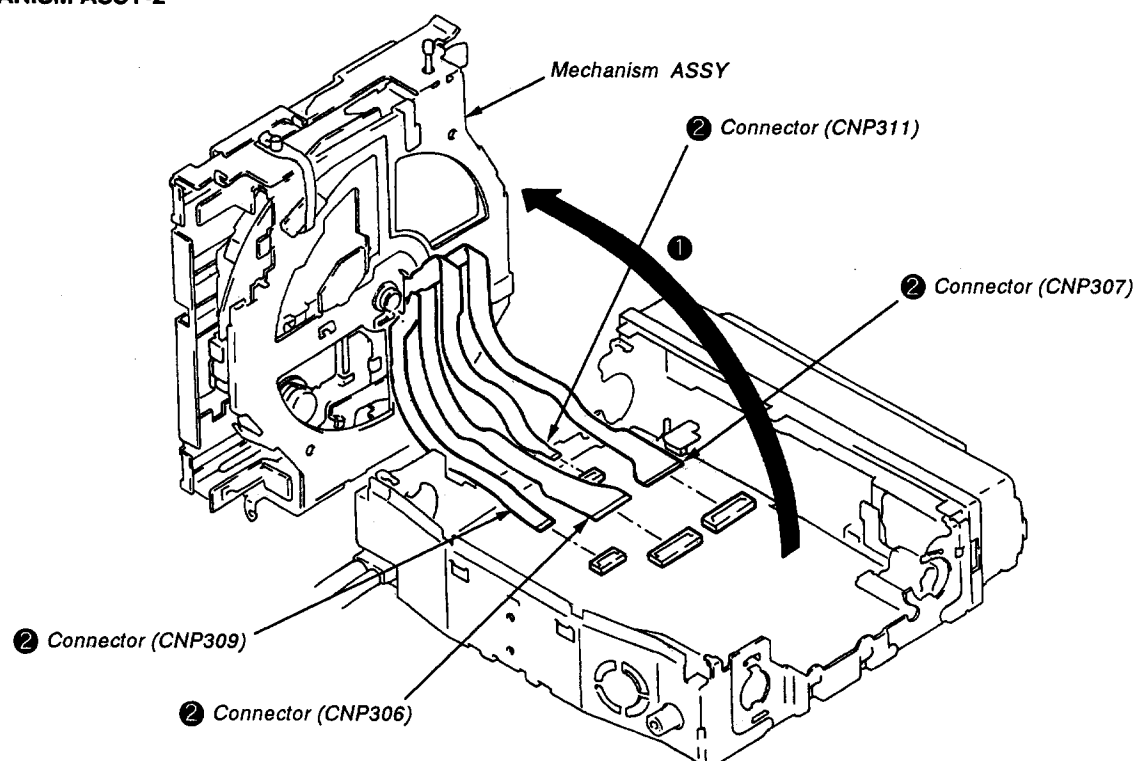
### 1-3. DAMPER (MC)



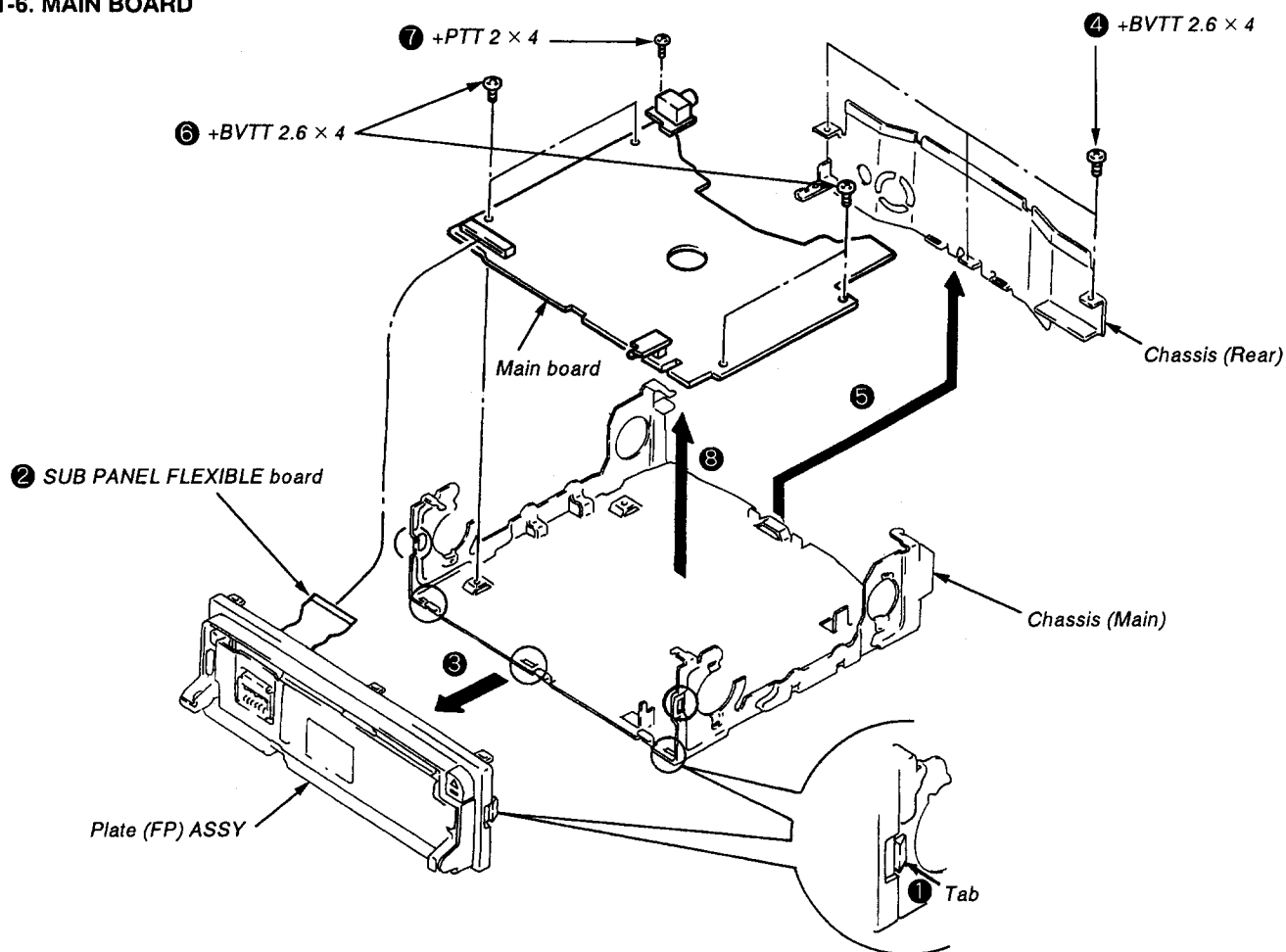
### 1-4. MECHANISM ASSY-1



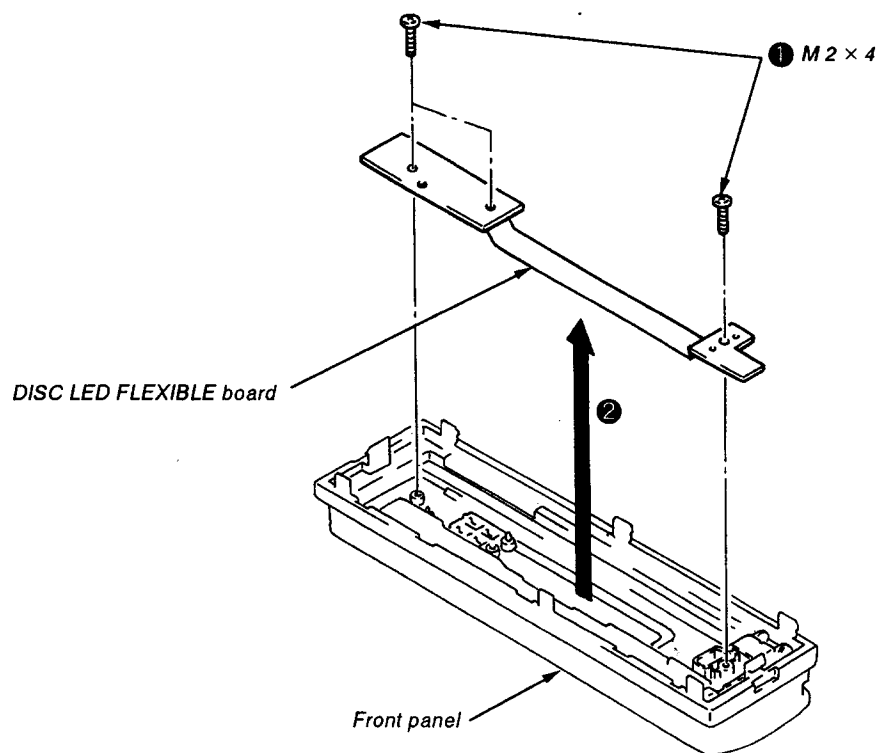
## 1-5. MECHANISM ASSY-2



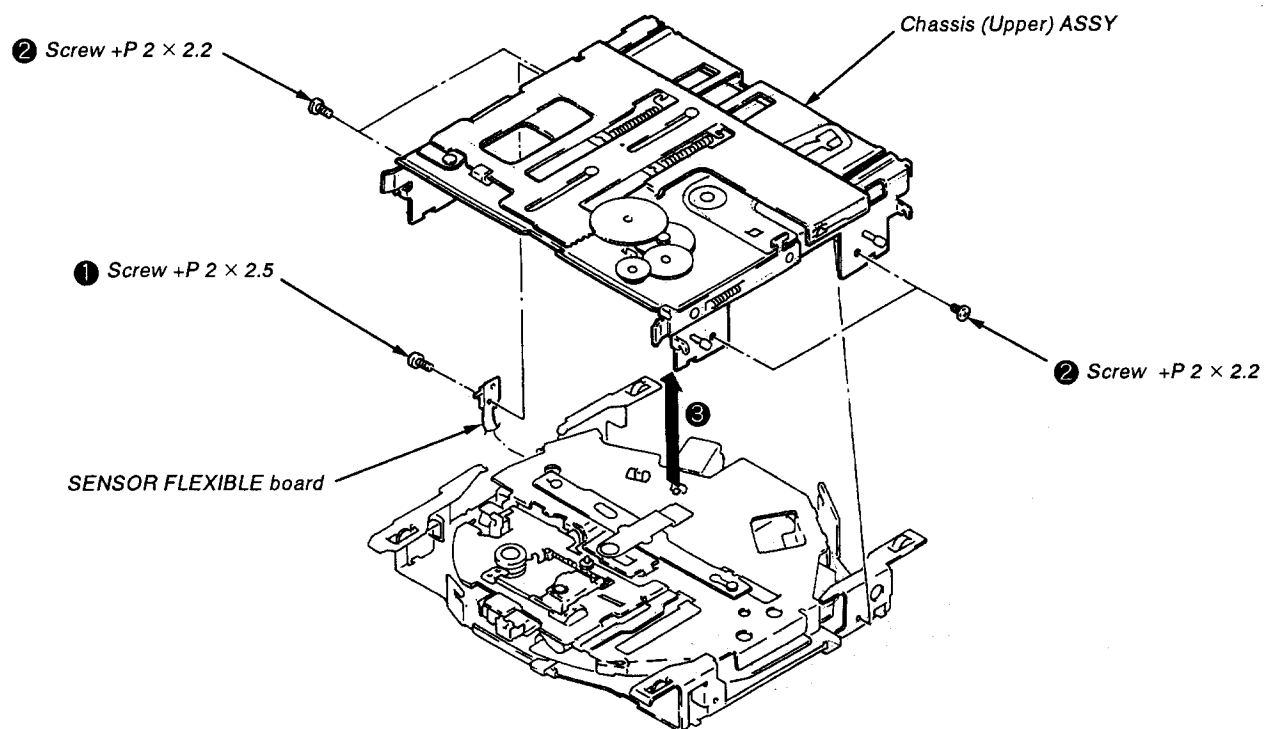
## 1-6. MAIN BOARD



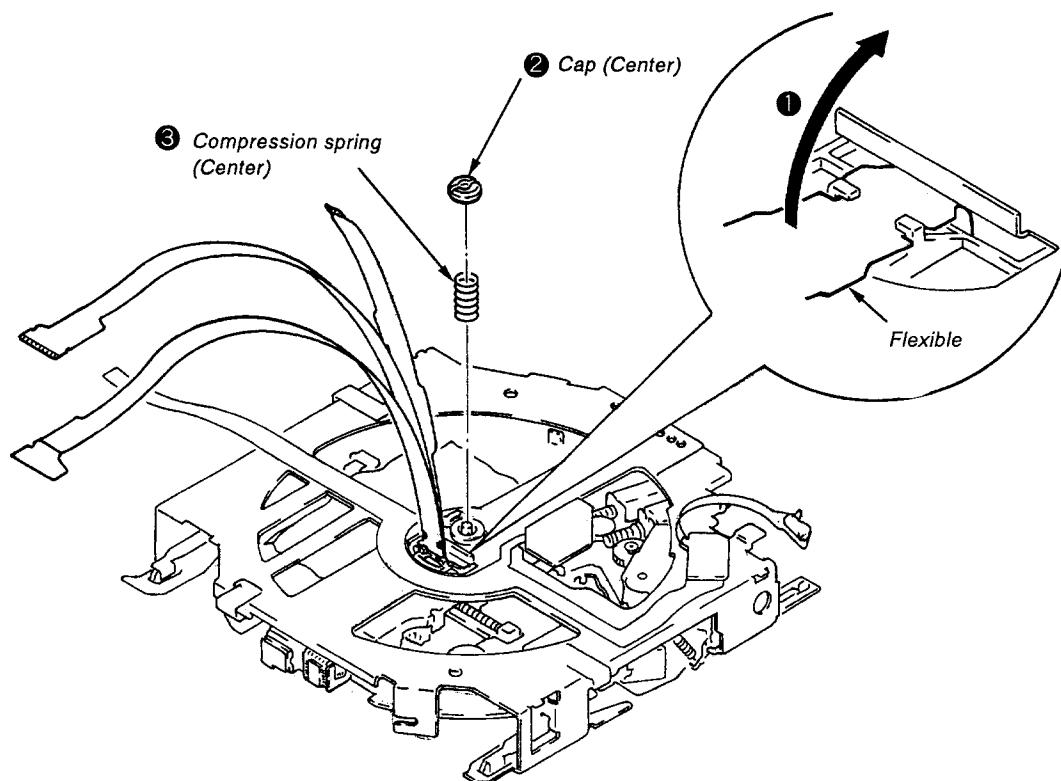
### 1-7. DISC LED FLEXIBLE BOARD



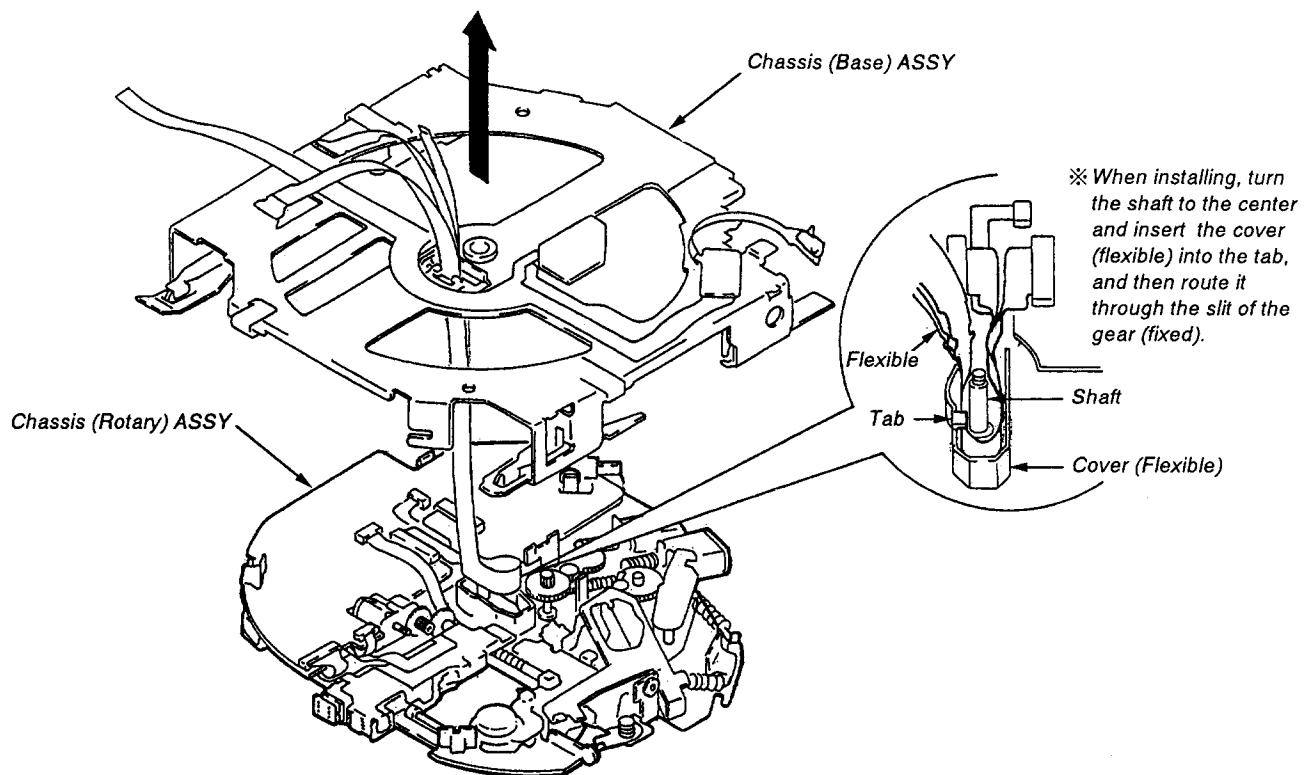
### 1-8. SENSOR FLEXIBLE BOARD, CHASSIS (UPPER) ASSY



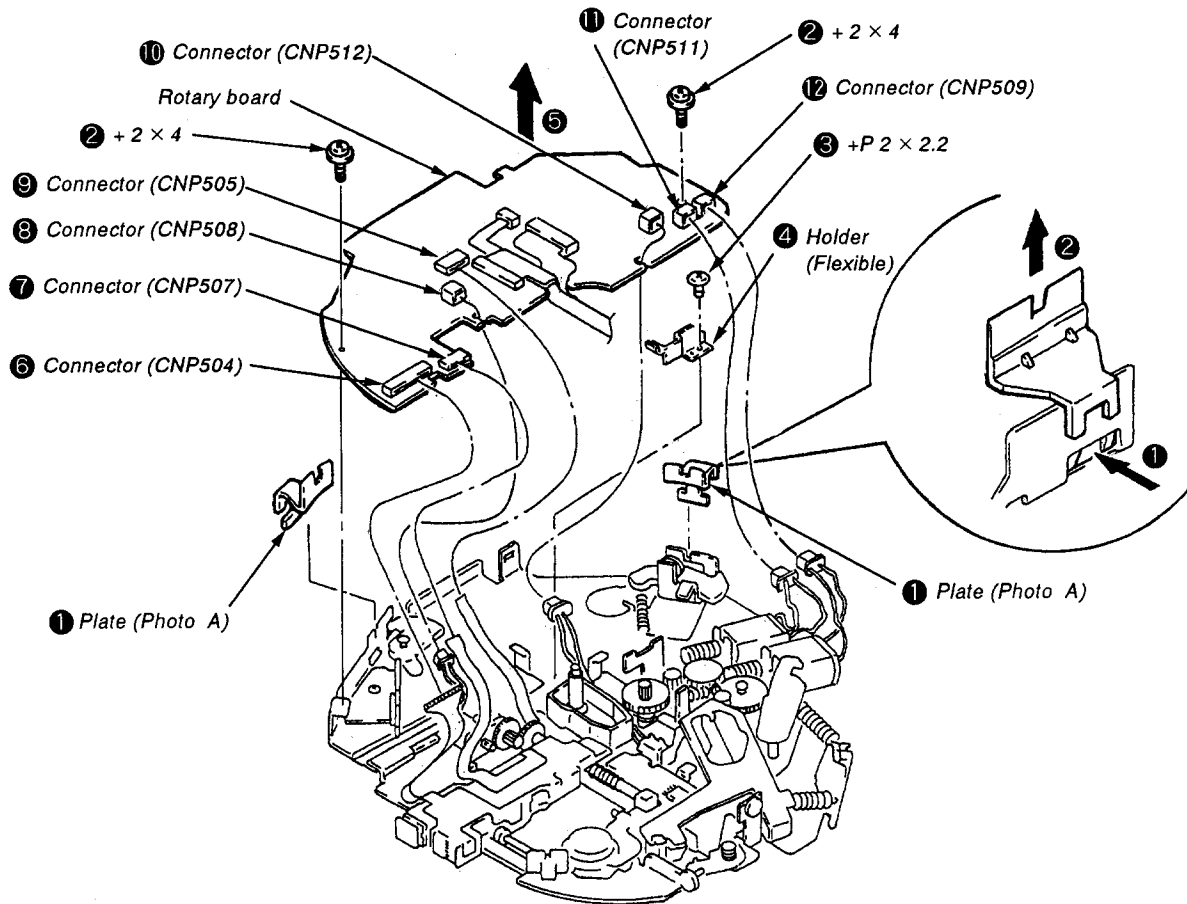
## 1-9. CHASSIS (ROTARY) ASSY-1



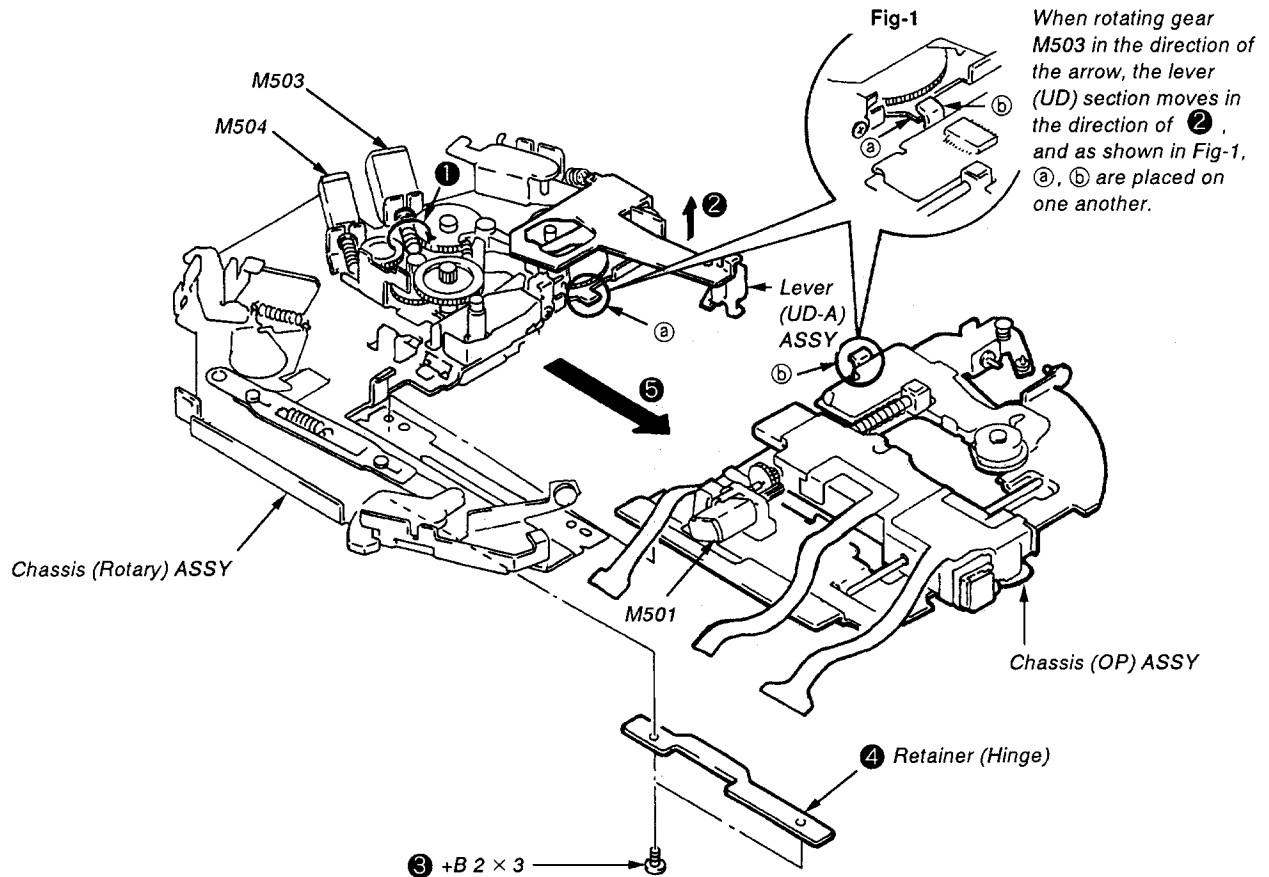
## 1-10. CHASSIS (ROTARY) ASSY-2



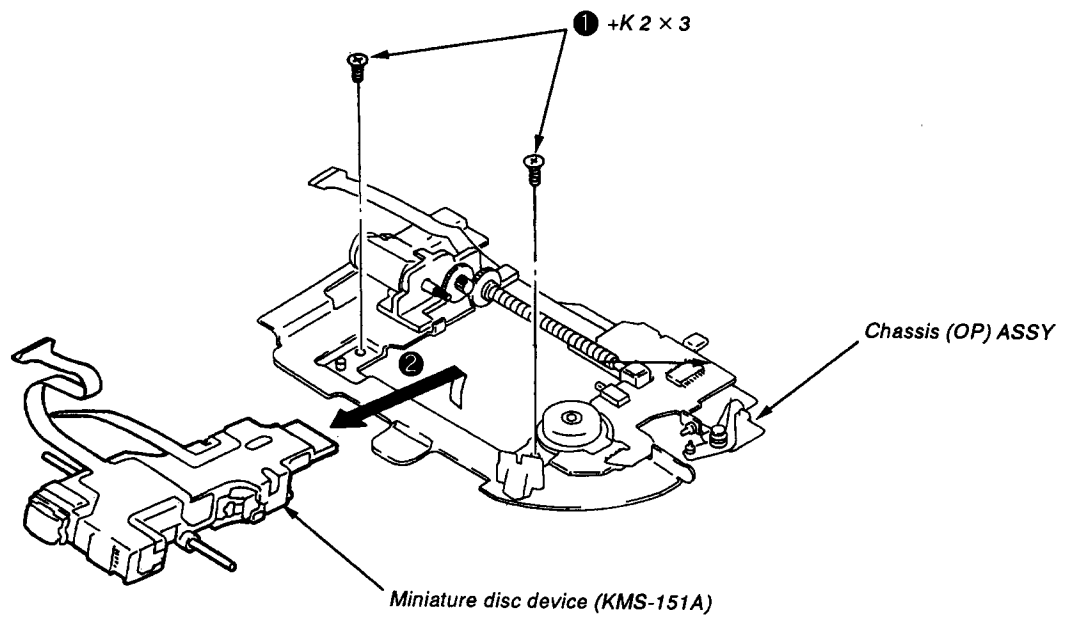
## 1-11. ROTARY BOARD



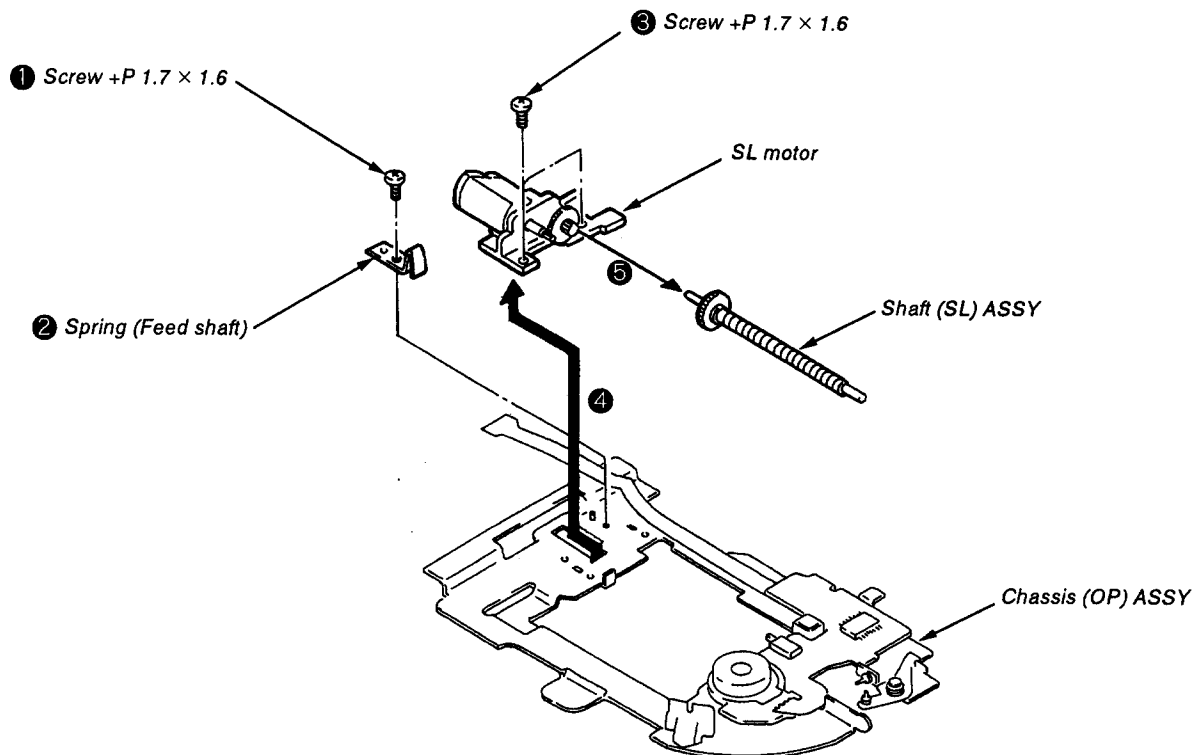
## 1-12. CHASSIS (OP) ASSY



### 1-13. MINIATURE DISC DEVICE (KMS-151A)

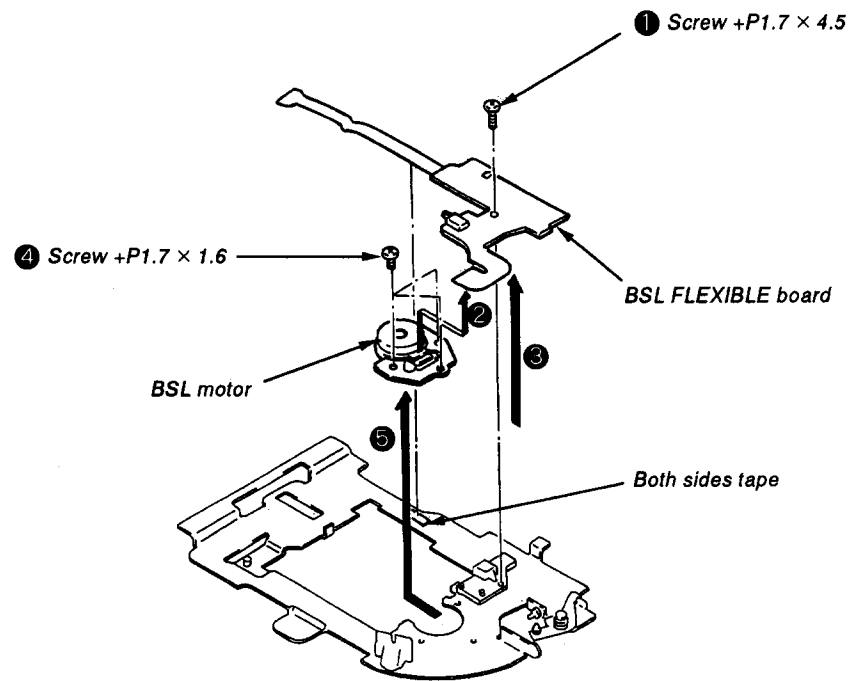


### 1-14. SL MOTOR/SHAFT (SL) ASSY



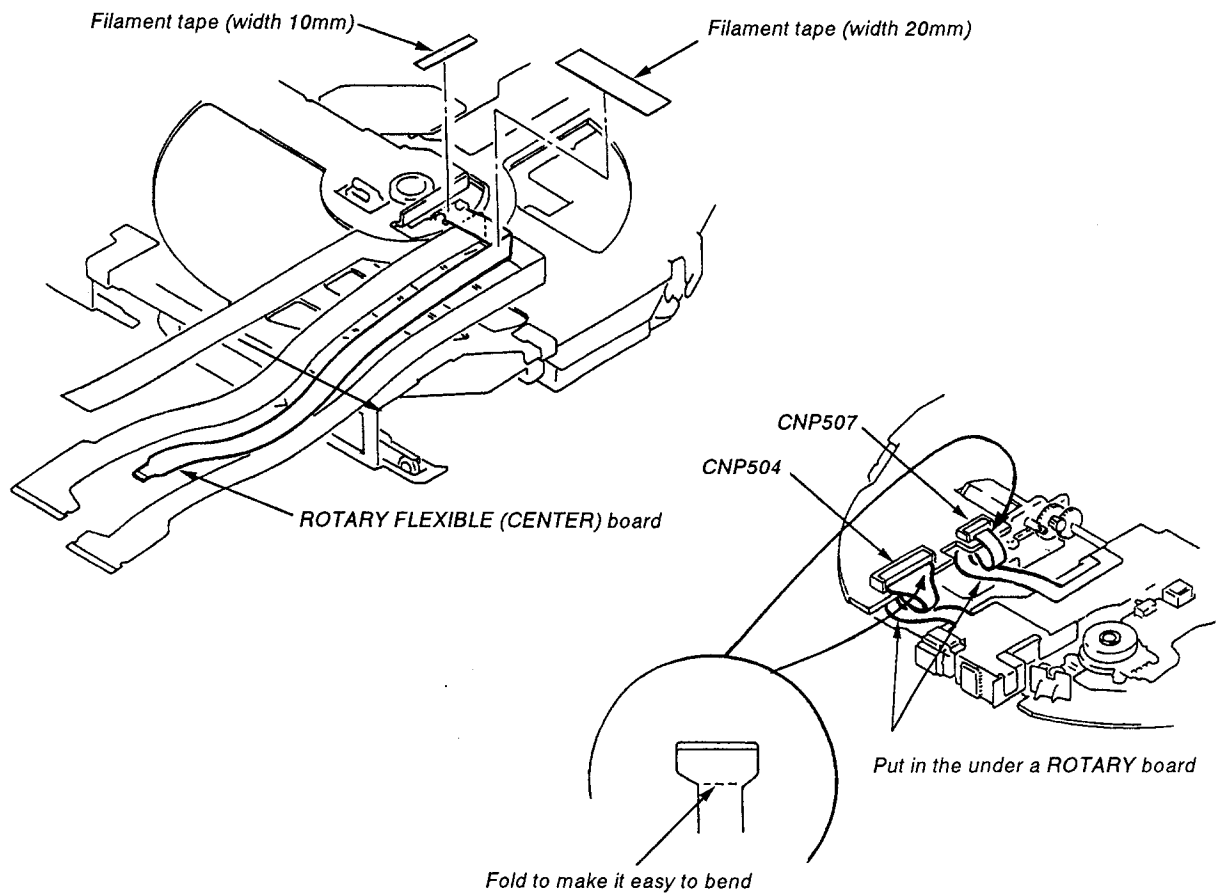
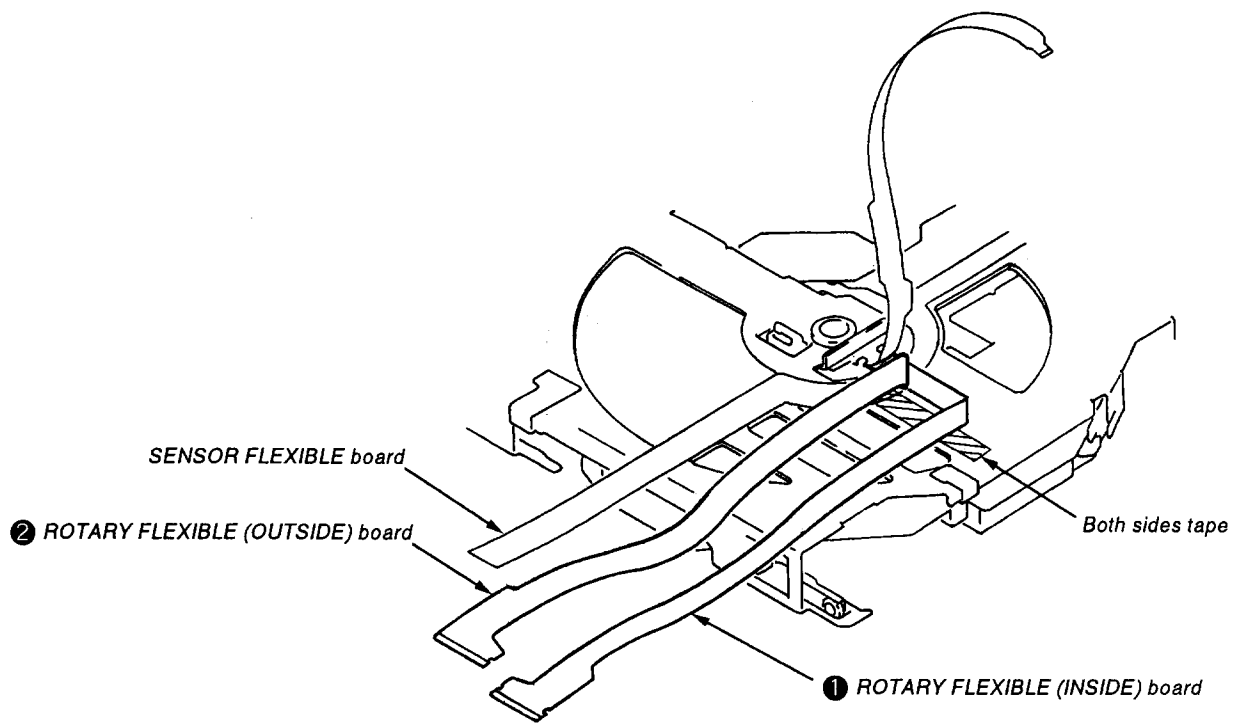


## 1-15. BSL MOTOR



## SECTION 2

### HOW TO BEND IN A ROTARY FLEXIBLE BOARD



## SECTION 3 TEST MODE

### OUTLINE OF TEST MODE

Mechanism and servo test mode are described here. Test mode can operate independently with only the mechanism deck, and it changes by the key input from nose panel. During test mode, ⑤ Pin (Lock) terminal of IC306 (CXD2525R) becomes interlocked with the display. The test mode is divided into MD test mode (indash test mode) and set test mode (test mode of the entire system).

#### Note :

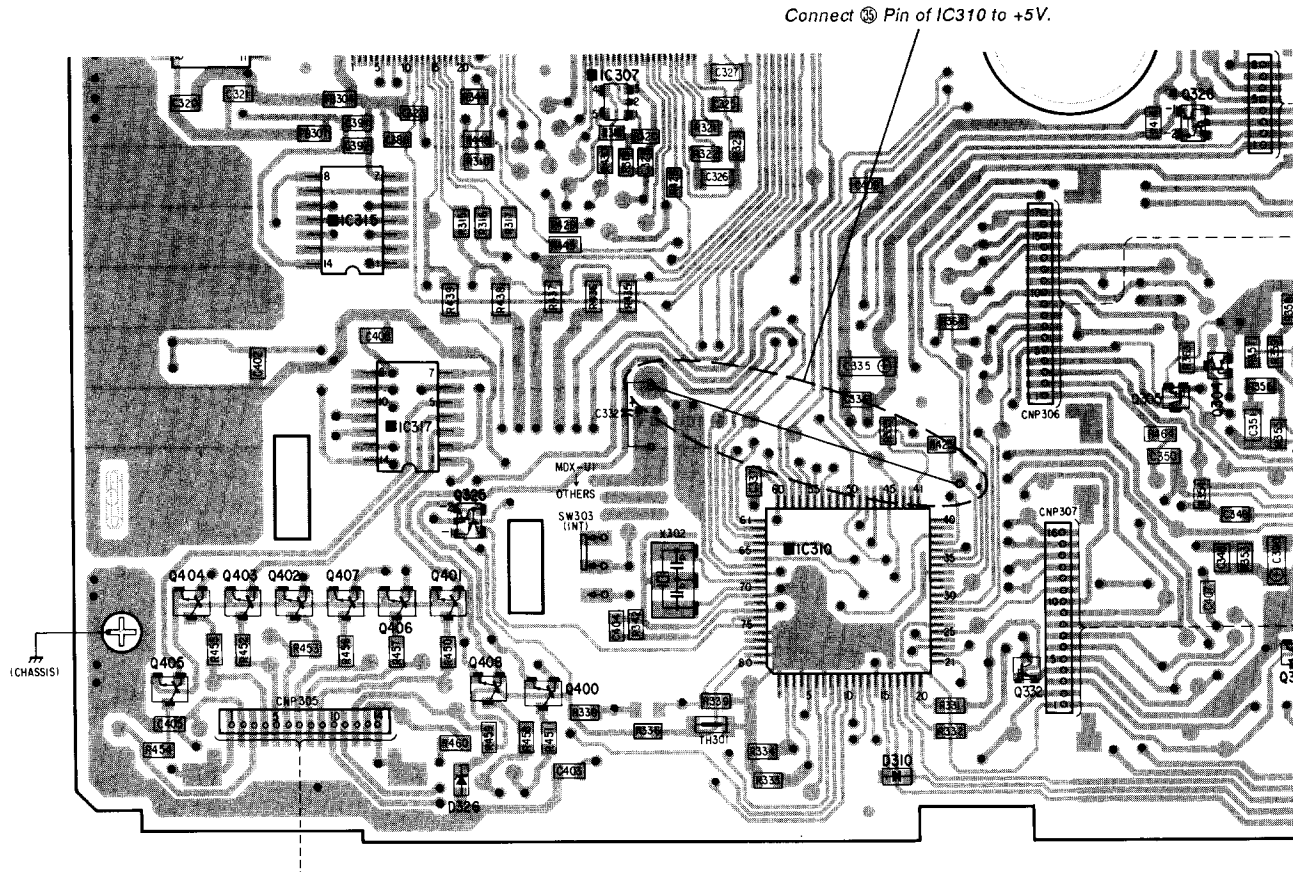
A master unit is required to operate this unit (XR-705 or XR-805).  
In the test mode or during electric adjustment, the buttons on the master unit shall be used.

### Set (entire system) test mode setting

1. Press preset button 4.
2. Press preset button 5.
3. Press preset button 1 for about 2 seconds.
4. All ON appears on the display, and test mode becomes set.  
(To cancel the test mode, press OFF button.)

### MD (Indash) test mode setting

1. Press the MD button in test mode with the above setting (entire system).
2. Press the preset button 4 longer than 1 second, and stop the MD player.  
(To cancel the test mode, press the OFF button of the master unit.)



**1. Playback Test Mode (Set (entire system) at the time of test mode and MD (indash) test mode)**

No.	Key input	Operation
1	Press <b>MD</b> button	Regular playback test mode becomes set.
2	Press <b>1</b> button for 1 second	AMS down occurs.
	Press <b>2</b> button for 1 second	AMS UP occurs.
	Press <b>3</b> button for 1 second	PLAY mode (SHUFFLE OFF/INTRO SHUFFLE 2)
	Press <b>4</b> button for 1 second	MD stops.

**2. Mechanism/Servo Test Mode (MD (indash) at the time of test mode)**

No.	Key input	Operation
1	Press the <b>4</b> button for 1 second in test mode with the MD playback	Mechanism/servo test mode
2	Press <b>1</b> button for 1 second	High speed FOCUS serch/CLV ON.
	Press <b>2</b> button for 1 second	TRACKING SLED ON (CLVP)/OFF (CLVS) (Can be pressed only when FOCUS ON)
	Press <b>3</b> button for 1 second	Point feed during SLED (300ms peripheral feed, after innermost peripheral feed)
	Press <b>4</b> button for 1 second	Servo STOP
	Press <b>5</b> button for 1 second	Pre-MD LD ON/OFF (Switches over every time pressed)
	Press <b>6</b> button for 1 second	Rec-MD LD ON/OFF (Switches over every time pressed)
	Press <b>7</b> button for 1 second	SLED FW (While pressed)
	Press <b>8</b> button for 1 second	SLED RVS (While pressed)
	Press <b>9</b> button for 1 second	DISC chucking/release (State reversed every time pressed)
	Press <b>10</b> button for 1 second	DISC UP (1 – 2 – 3 – 4 – 1 address set, every time when pressed)
3	Press <b>OFF</b> button for 1 second	Causes test mode off/reset.

## SECTION 4

### ELECTRICAL ADJUSTMENTS

#### Setting of Test Mode

1. Press **OFF** button (OFF state becomes set).
2. Press preset **4** button.
3. Press preset **5** button.
4. Press the preset button **1** for approximately 1 second.
5. Entire display turns ON, and test mode is instated.

#### Prior to Adjustment

1. Set MD (indash) test mode (See page 11).
2. The functions of each button at this time are as per mechanism/servo test mode (See page 12).
3. Make all the adjustments in test mode, as in the given order.

#### FOK OFFSET Adjustment

1. Connect VOM between IC504 ① (VR) and ③ (ABCD).
2. Press **6** for 1 second (LASER ON), and adjust RV501 so that the VOM reading becomes  $-200 \pm 10\text{mV}$ .
3. Press **4** for 1 second (STOP).

#### Laser Power adjustment

##### ● Method using the laser power meter

1. Turn ON the laser by pressing **6** for 1 second.
2. Adjust the position of SLED by pressing **3** for 1 second.  
Adjust RV506 so that a laser output of  $810 \pm 5 \mu\text{W}$  is obtained with 780nm setting.

##### ● Method using EYE PATTERN

Set a playback DISC (Pre-master DISC), turn ON PLAY, and adjust RV506 so that 1.4Vp-p is obtained.

#### MO Focus Bias Adjustment

1. Connect VOM between IC504 ① (VR) and ② (FE).
2. Press **6** for 1 second (LASER ON), and adjust RV504 so that the VOM reading becomes  $-300 \pm 10\text{mV}$ .
3. Press **4** for 1 second (STOP).

#### PIT Focus Bias Adjustment

1. Connect VOM between IC504 ① (VR) and ② (FE).
2. Turn ON the laser by pressing **5** for 1 second (LASER ON).
3. Adjust RV505 so that the VOM reading becomes  $-100 \pm 10\text{mV}$ .
4. Press **4** for 1 second (STOP).

#### PIT E-F Balance Adjustment

1. Connect VOM between IC504 ① (VR) and ④ (TE).
2. Set DISC (PIT).
3. Press **1** for 1 second (FOCUS ON), and adjust RV502 so that the VOM reading becomes  $-0 \pm 10\text{mV}$  (Check both playback DISC and MO DISC).

#### MO E-F Balance Adjustment

1. Connect VOM between IC504 ① (VR) and ④ (TE).
2. Set DISC (MO).
3. Press **1** for 1 second (FOCUS ON), and adjust RV503 so that the VOM reading becomes  $-0 \pm 10\text{mV}$  (Check both playback DISC and MO DISC).

## Focus/Tracking Gain Adjustment

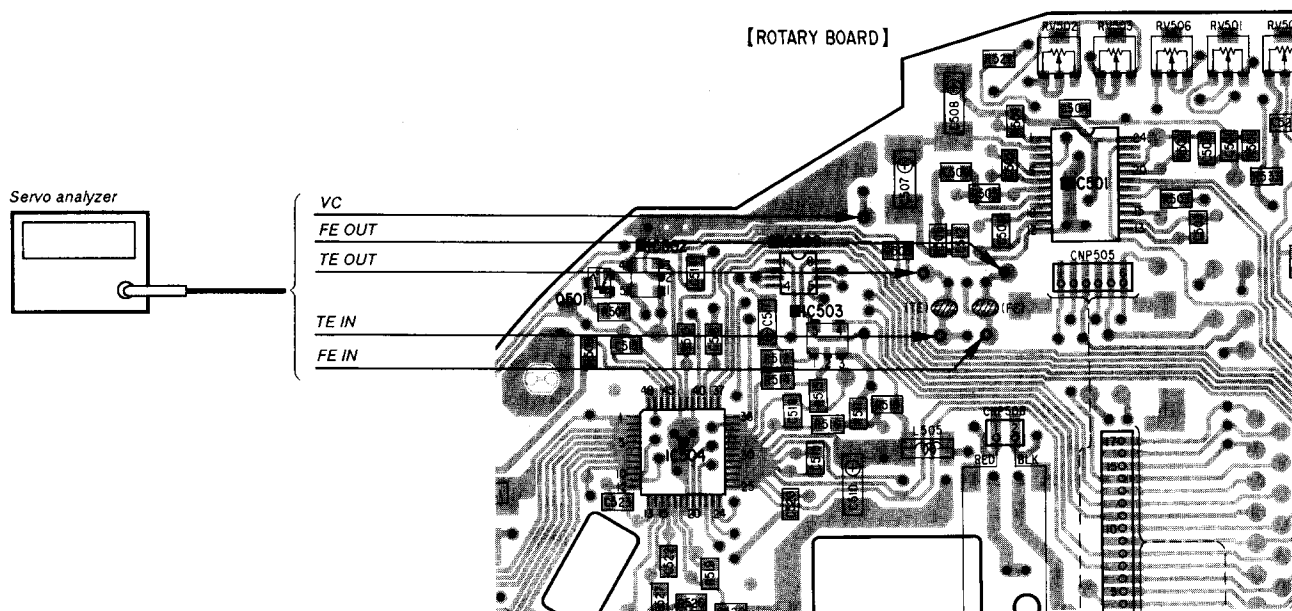
- Servo analyzer is needed to make this adjustment accurately.

### Method of connecting to servo analyzer :

1. Disconnect the 2 soldered jumpers of TE & FE, and connect the servo analyzer as shown in the following diagram. At this time, connect IC504 to the output of servo analyzer, and the volumes to the input of servo analyzer.
2. Set the disturbance of servo analyzer at 1.2kHz, 50mV.

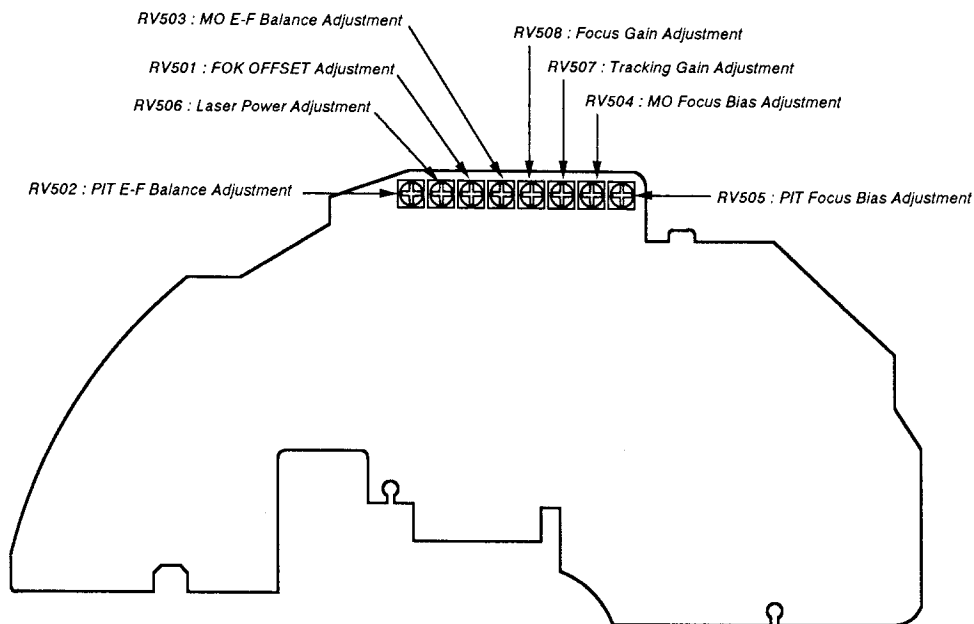
### Procedure :

1. Insert MO disc (SONY 60 minute) in its magazine, and place it in the set.
2. Set MD (indash) test mode (See page 11).
3. Turn ON the FOCUS and CLV by pressing **[1]** for 1 second.
4. Turn on the tracking servo by pressing **[2]** for 1 second, and adjust RV507 (Tracking Gain Adjustment) and RV508 (Focus Gain Adjustment) so that both the tracking and focus become  $-1 \pm 0.5$  dB.
5. Disconnect the servo analyzer, and short the 2 soldered jumpers of TE & FE.



### Adjustment Location :

**[ROTARY BOARD]** (Conductor side)



## SECTION 5

### EXPLANATION OF IC TERMINALS

#### IC301 AK4318 (MAIN BOARD)

Pin No.	Pin name	I/O	Description
1	NC	—	Not used. (OPEN)
2	VREF	O	Reference voltage output terminal. (AVDD) – 3.6V
3	NC	—	Not used (GND connection in this device).
4	AVDD	—	Analog power supply terminal. (+5V)
5	AVSS	—	Analog GND terminal.
6	TST	I	Test pin. Set open or at “L” (GND connection, in this device).
7	ZMUTE	I	Zero mute terminal Detects zero input and mutes the output, while “H”. (OPEN, in this device)
8	DIF0	I	Input format terminal (GND connection, in this device). Handles 4 modes.
9	DIF1	I	
10	DVSS	—	Digital GND terminal.
11	DVDD	—	Digital power supply terminal. (+5V)
12	LRCK	I	L/R Clock terminal Determines the channel of the input serial data.
13	BICK	I	Serial bit clock terminal. Clocks for latching the serial data.
14	SDATA	I	Serial data input terminal. 2's Complement, MSB first
15	$\overline{\text{PD}}$	I	Reset terminal. Filter and modulator become reset, when this pin is set at “L”.
16	XTI	I	Clock input terminal. Either a crystal oscillator is connected between this pin and XTO, or external CMOS clocks are input to XTI. The frequency of clocks can be selected with CKS pin.
17	XTO	O	Quartz oscillator output terminal. When using a quartz oscillator, it connected between this pin and XTI. When using external clocks, this pin is kept open. (OPEN, in this device)
18	SMUTE	I	Soft mute terminal. (pull down pin) Starts soft mute while “H”, and cancels it while “L”. (OPEN, in this device)
19	DEM0	I	De-emphasis mode terminal. Corresponds to frequency.
20	DEM1	—	Not used (GND connection, in this device).
21	CKS	I	Clock selection terminal (GND connection, in this device). “L” : CLS=256fs, “H” : CLK=384fs
22	DZF	I	ZERO input detected terminal.
23	AOUTR –	O	R ch Analog negative output terminal.
24	AOUTR+	O	R ch Analog positive output terminal.
25	AOUTL –	O	L ch Analog negative output terminal.
26	AOUTL+	O	L ch Analog positive output terminal.
27, 28	NC	—	Not used. (OPEN)

**IC310  $\mu$  PD78056YGC-W08-3B9 (MAIN BOARD)**

Pin No.	Pin name	I/O	Description
1	NOSE SW	I	Input terminal showing front panel or no front panel. 5V : Front panel, 0V : No front panel (GND connection, in this device).
2	HOME/TOP SW	I	Input terminal of HOME as well as TOP POSITION detecting SW of TURN TABLE. 5V : HOME, 2.5V : TOP, 0V : Others
3	PANEL	I	Input terminal showing OPEN/CLOSE of front panel. 5V : CLOSE, 0V : OPEN
4	AVss	—	GND Potential of A/D converter.
5	LDPOWER	O	Laser power adjusting terminal. L : Low reflection DISC (MO) 0.5mW : 2.9V, H : High reflection DISC (CD) 0.25mW : 2.7V
6	RMS	—	RMS Output of DRAM (D/A output). (OPEN, in this device).
7	AVREF1	—	Reference voltage input of D/A converter. (GND)
8	LCD-BUSY	I	Terminal to input BUSY from LED driver. (74HC164AF)
9	LCD-DATAOUT	O	Terminal to output DATA to LED driver. (74HC164AF)
10	LCD-CLKOUT	O	Terminal to output CLK to LED driver. (74HC164AF)
11	SRDT	I	Terminal to input READ DATA for serial communication to MD servo IC.
12	SWDT	O	Terminal to output WRITE DATA for serial communication to MD servo IC.
13	SCK	O	Terminal to send CLOCK for serial communication to MD servo IC.
14	LINKOFF	—	Not used. (OPEN)
15	BUS-REQUEST	O	<div style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 5px; display: inline-block;">                     Terminals for uni-link                 </div>
16	BUS-DATAIN	I	
17	BUS-DATAOUT	O	
18	BUS-CLKIN	I	
19	RF-SW0	O	DISC Mode. L : MO, H : CD
20	RF-SW1	O	DISC Mode. L : GROOVE, H : PIT
21	ASY-SW	O	At the time of PIT playback : Fixed at HIGH At the time of MO playback : Always H, L at the time of track jump
22	AGC-SW	O	L : FOCUS end (AGC time constant long), H : FOCUS start (AGC time constant short)
23	MIRR-SW	O	At the time of PIT playback : Fixed at LOW At the time of MO playback : Always H, CLV at the time of track jump, L until the build up of ON of tracking & thread becomes OK.
24	DFCT-SW	O	L : All servo ON, H : FOCUS start
25	SLD-MUTE	O	Motor drive control output terminal. L : OFF, H : ON
26	LD ON	O	LASER ON/OFF output. L : ON, H : OFF
27	NC	—	Not used. (OPEN)
28	CD/MO	I	CD/MO Identifying terminal. H : CD, L : MO
29	SENS	I	Terminal to input SENSE from CXA1082, CXD2525.
30	LOCK	I	Terminal to input from CXD2525. L : CLV UNLOCK, H : CLV LOCK



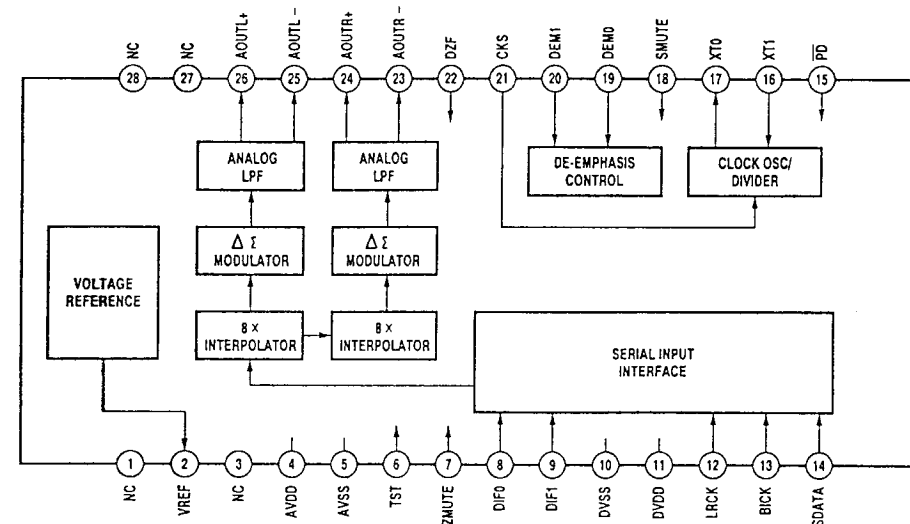
Pin No.	Pin name	I/O	Description
31, 32	NC	—	Not used. (OPEN)
33	Vss	—	Micro computer GND. (0V)
34	DIRC	O	L : 1 Track Jump End, H : 1 Track Jump TZC detect
35	TEST MODE	I	L : Normal, H : Indash Singular test mode
36	SBMN	O	CXD2526 SBMN switch over. H : SUB, L : MAIN
37	WRMN	O	L : DT=RAM Write stop, H : DRAM Write start
38	OPEN LED	O	Turns ON, when ILL ON and PANEL OPEN. H : OFF, L : ON
39	NC	—	Not used. (OPEN)
40	NC	—	Not used. (OPEN)
41	XINT	I	Interruption of CSD2526. Build-up edge detection.
42	NC	—	Not used. (OPEN)
43	NC	—	Not used. (OPEN)
44	MD-POWERON	O	Mechanism deck power terminal. L : OFF, H : ON
45	TABLE-UPDOWN	O	Terminal of the turn table up/down motor.
46	NC	—	Not used. (OPEN)
47	TABLE-R	O	Driver IC control terminal of the turn table drive motor.
48	TABLE-L	O	
49	TABLE-BRAKE	O	Brake terminal of the turn table up/down motor.
50	MUTE	O	Audio MUTE output. L : CANCEL, H : MUTE
51	NC	—	Not used. (OPEN)
52	NC	—	Not used. (OPEN)
53	NC	—	Not used. (OPEN)
54	DEEMP	O	DEEMPHASIS terminal. L : ON, H : OFF
55	XRST	O	2525, 2526 with build up, terminal to reset to digital filter.
56	XLAT	O	LATCH for serial communication to servo IC.
57	NC	—	Not used. (OPEN)
58	ILL ON	O	LED ON/OFF of SOURCE key of NOSE L : LED OFF, H : LED ON
59	KEY-ACTIVE	O	ON/OFF of the key of A/D input. L : Key non-operational, H : Operational
60	$\overline{\text{RESET}}$	I	RESET Terminal of micro computer.
61	SQSY/ATSY	I	SUB Q SYNC Interruption. Go down edge detection (when PIT) AIDP SYNC Interruption. Go down edge detection (when GROOVE)
62	KEYACK/SIRCS	I	KEYACK Terminal, when ILL ON of P126 = L. KEY-ACTIVE of P127 is built up from L to H, as soon as this terminal is built up from L to H by key operation. SIRCS Input terminal of remote control, when ILL ON of P126 = H.
63	TPS/NOSE ON	I	Optical sensor input for detecting turn table rotation. Also for WAKE UP from SLEEP MODE of micro computer dueto NOSE ON.
64	BU-CHECK	I	BACKUP Check terminal. L : No, H : Yes
65	MST	I	Magazine/no magazine detecting terminal. L : Nomagazine, H : Magazine

Pin No.	Pin name	I/O	Description
66	BUS-ON	I	Uni-link terminal. L : BUS ACTIVE, H : SLEEP
67	FOK	I	FOCUS OK. L : NG, H : OK
68	V <sub>DD</sub>	—	Micro computer power supply. (5V)
69	X2	—	Connection terminal for main system clock.
70	X1	—	Connection terminal for main system clock.
71	IC	—	Connection terminal for main system clock.
72	XT2	—	Not used. (OPEN)
73	TABLE- UPDOWN SW	I	Position detection SW input of turn table L : Others, H : Top or bottom limit position
74	AV <sub>DD</sub>	—	Analog power supply of A/D converter.
75	AVREF0	—	Reference voltage input of A/D converter.
76	NC	—	Not used. (GND connection, in this device)
77	NC	—	Not used. (GND connection, in this device)
78	INITIALIZE	I	0V : Digital, 5V : Analog
79	NC	—	Not used. (GND connection, in this device)
80	TEMP	I	Mechanism deck temperature detection. HIGH TEMP ERROR processing is executed immediately after dropping below a certain voltage value. HIGH TEMP, when less than 0.5889V. HIGH TEMP cancelled, when more than 0.6349V.

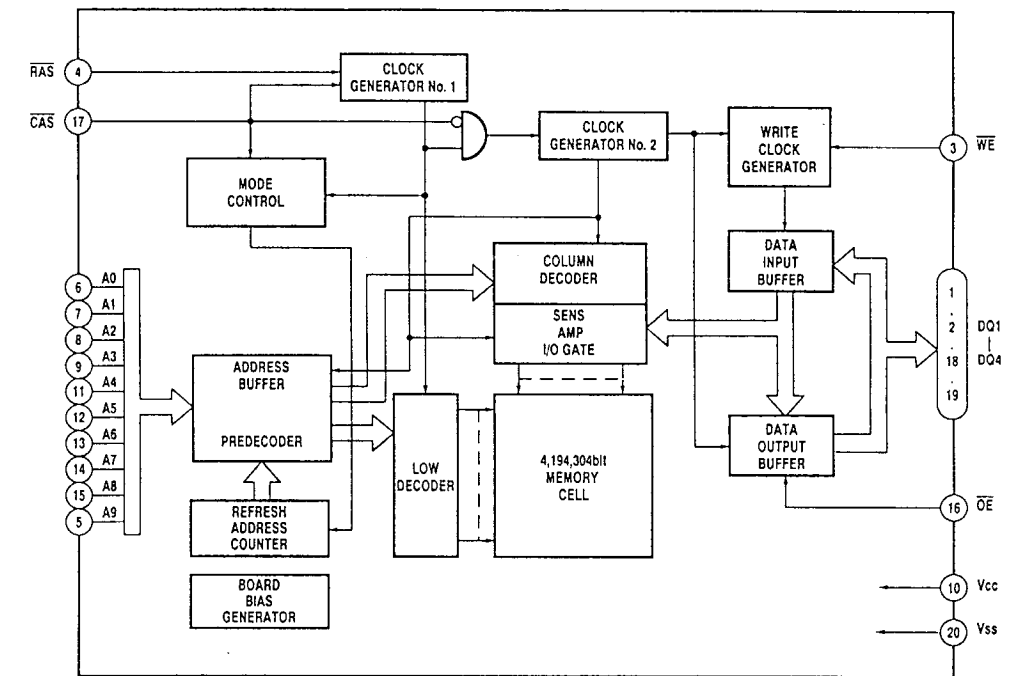
• IC BLOCK DIAGRAMS

— MAIN SECTION —

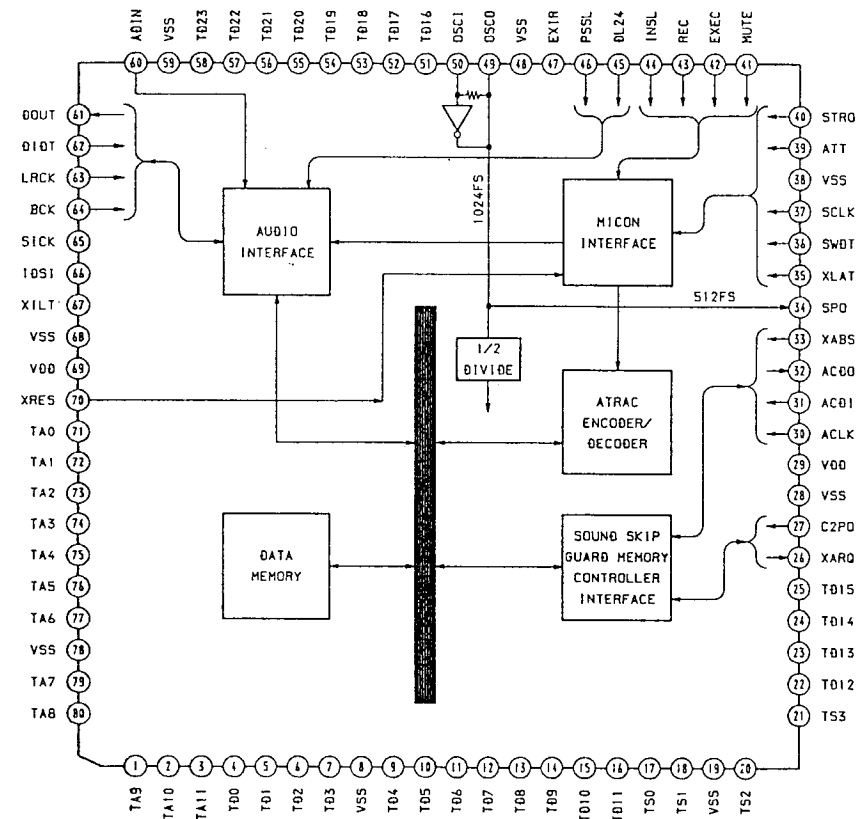
IC301 AK4318



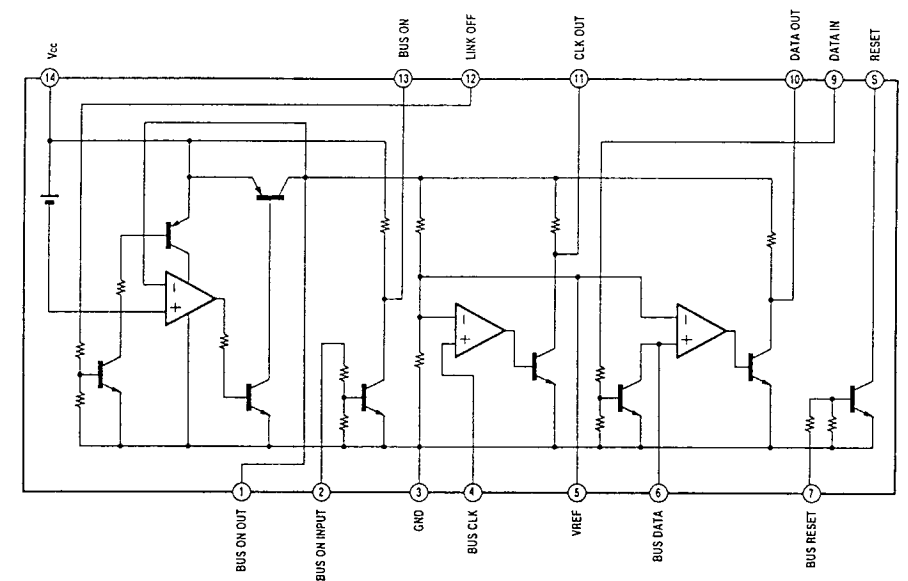
IC304 CXK414400TM-12



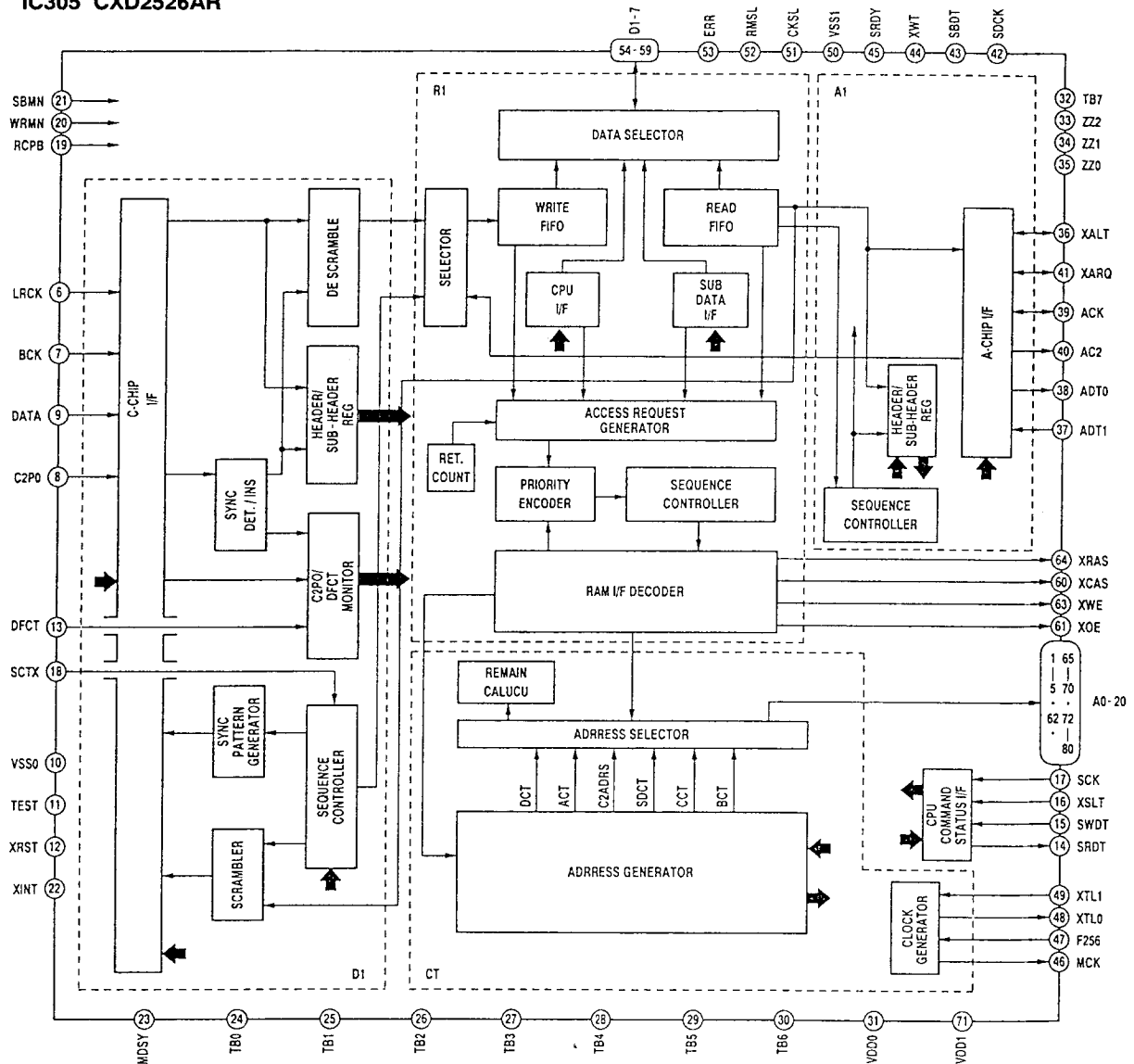
IC302 CXD2531R



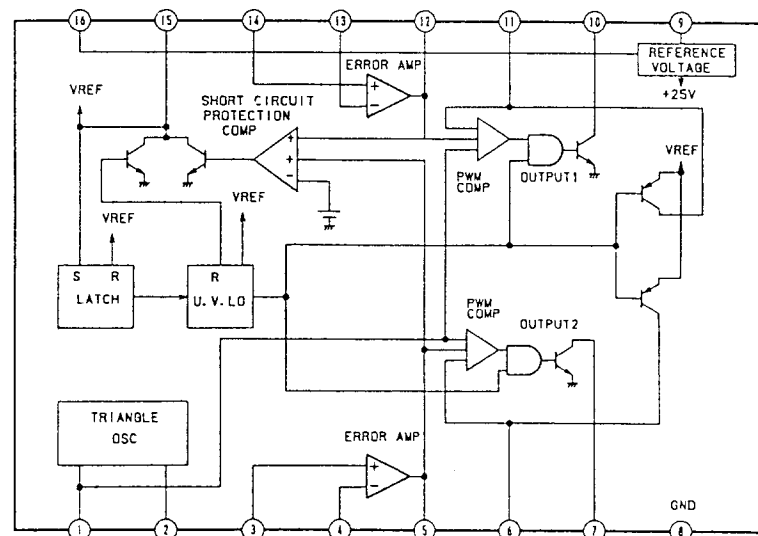
IC308 MM1176XFF (FORMER TYPE)  
MM1284XFFE (NEW TYPE)



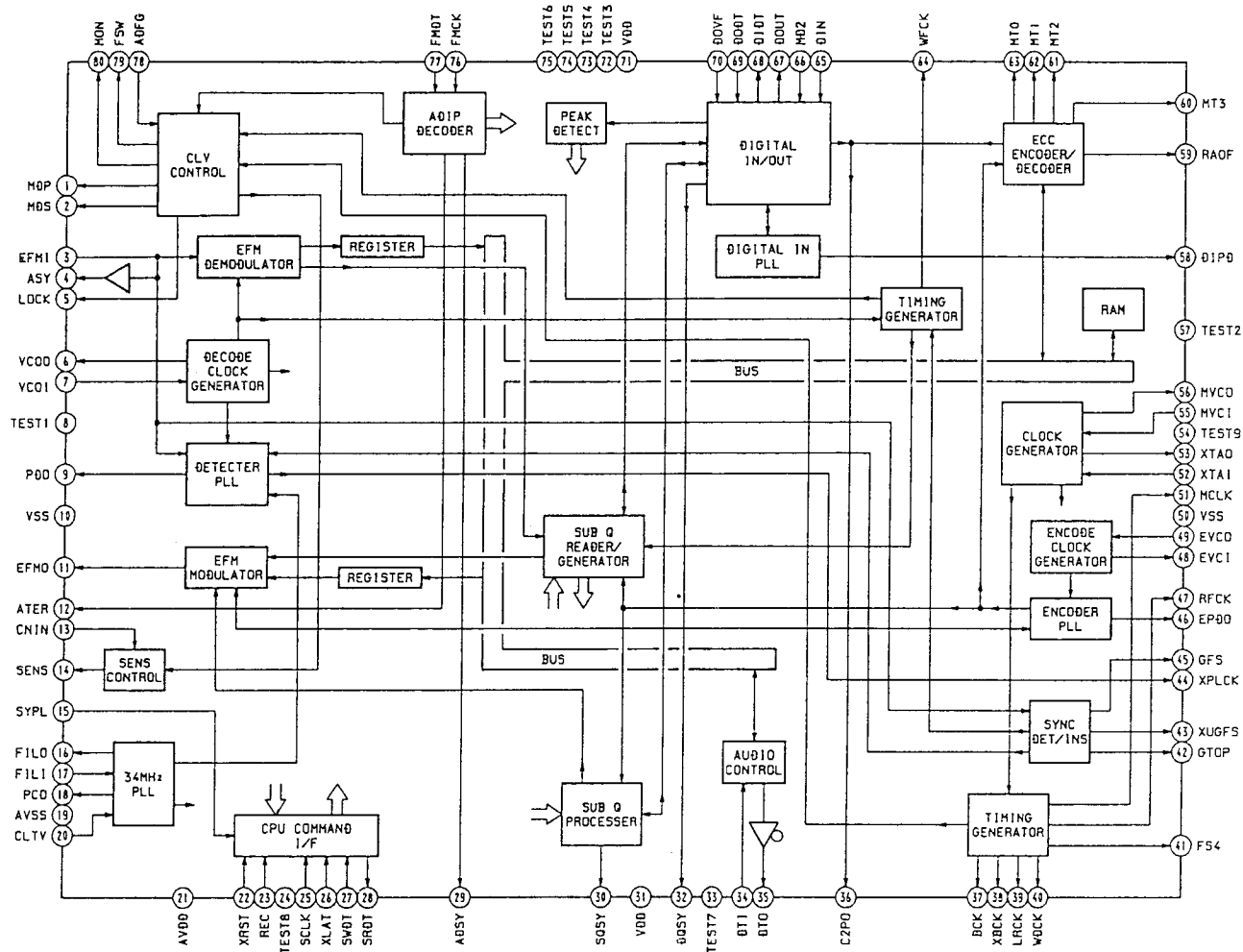
# IC305 CXD2526AR



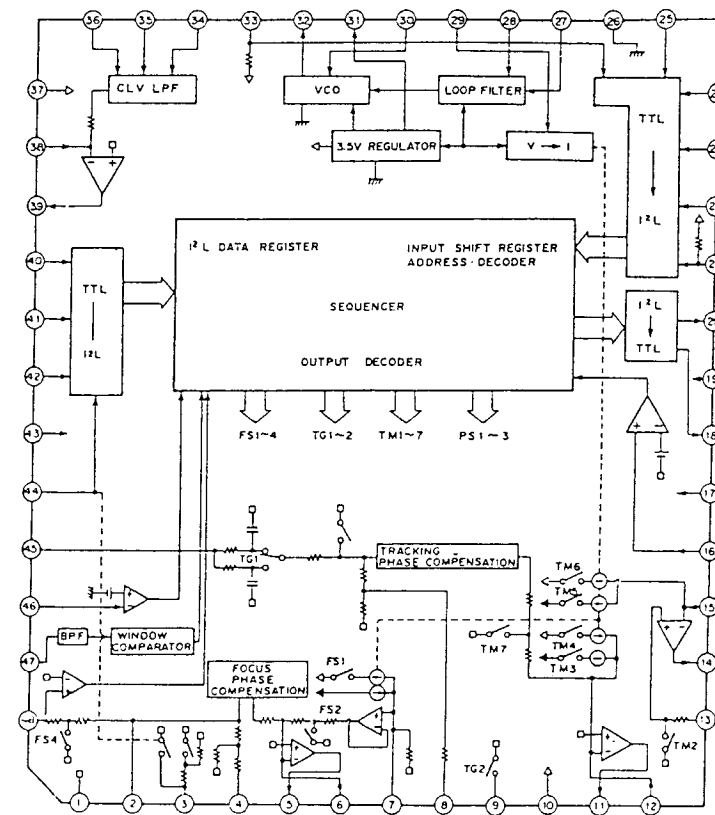
# IC314 TL1451ACDB



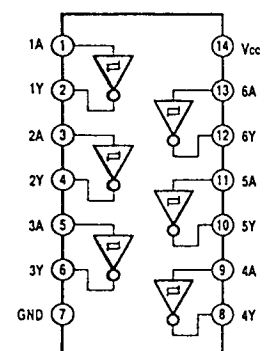
IC306 CXD2525R



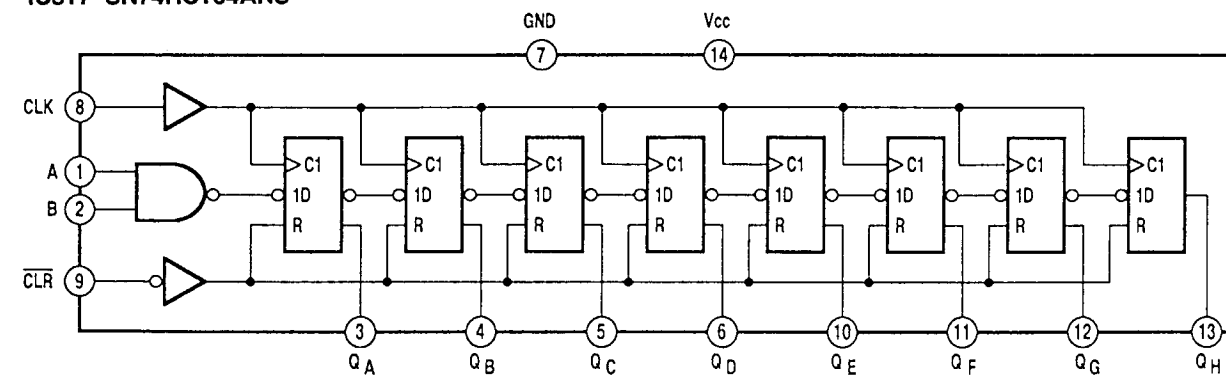
IC311 CXA1082BQ



IC315 TC74HC14AP

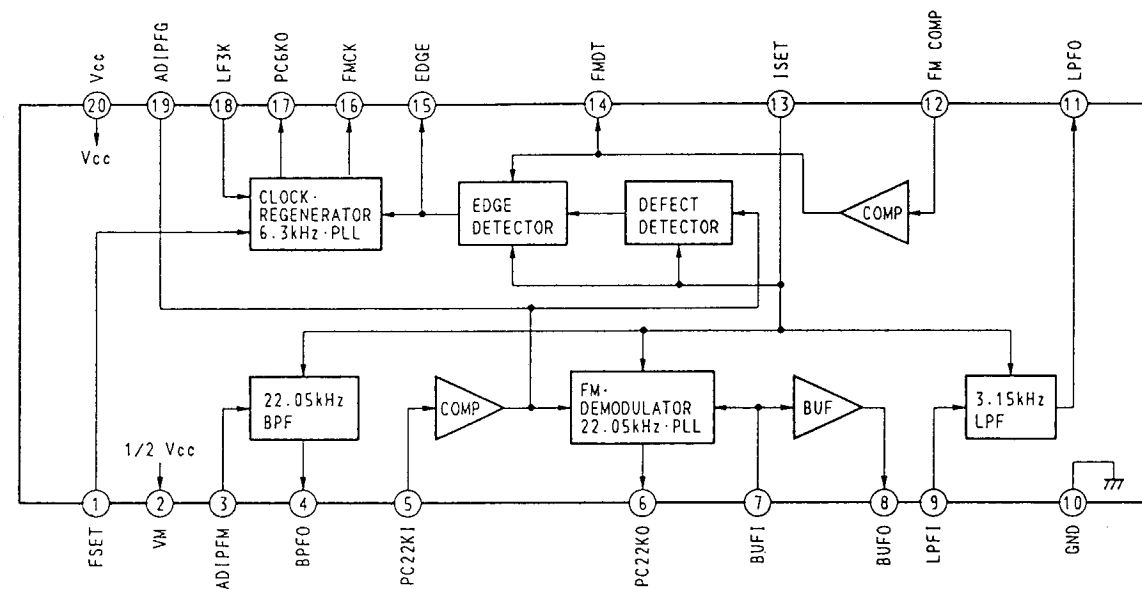


IC317 SN74HC164ANS

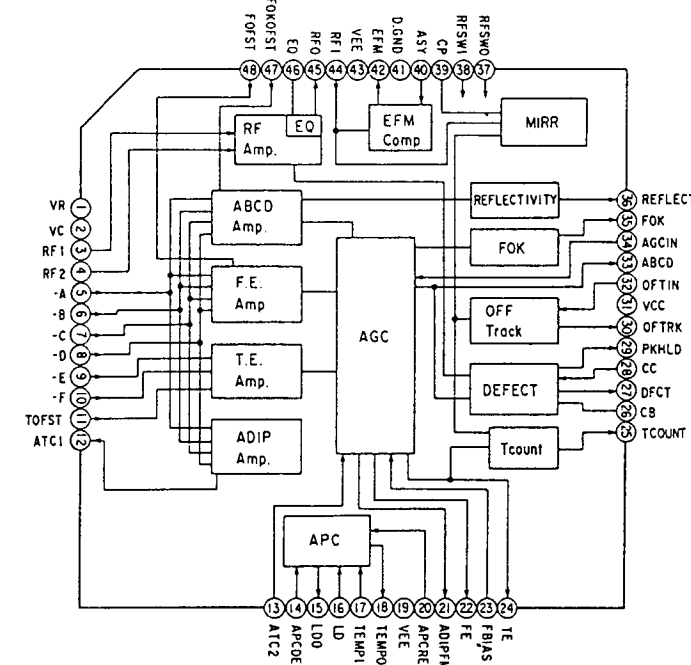


— ROTARY SECTION —

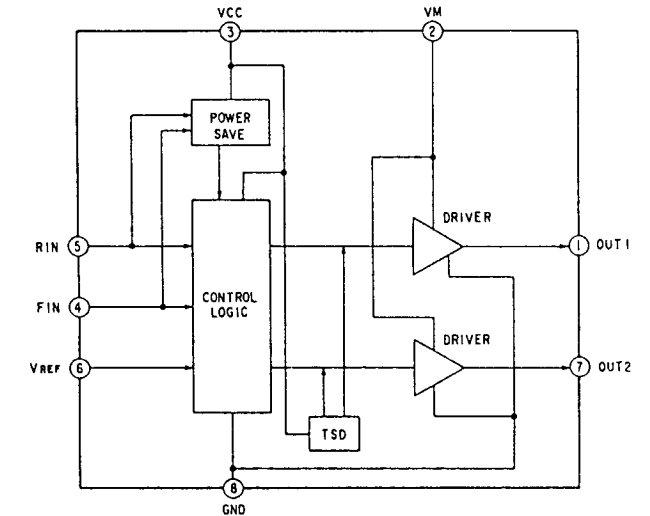
IC501 CXA1380N



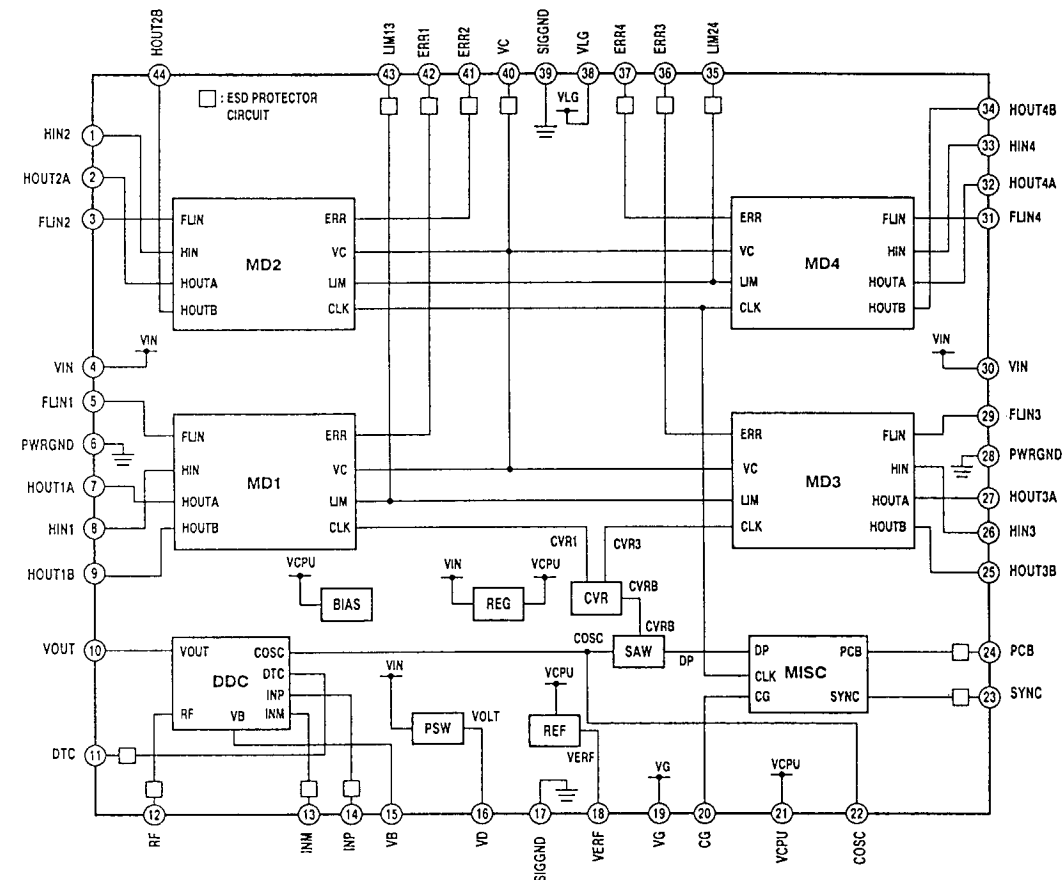
IC504 CXA1381R



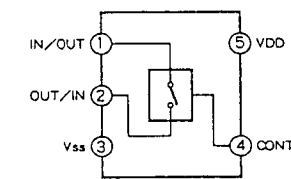
IC508 BA6287F



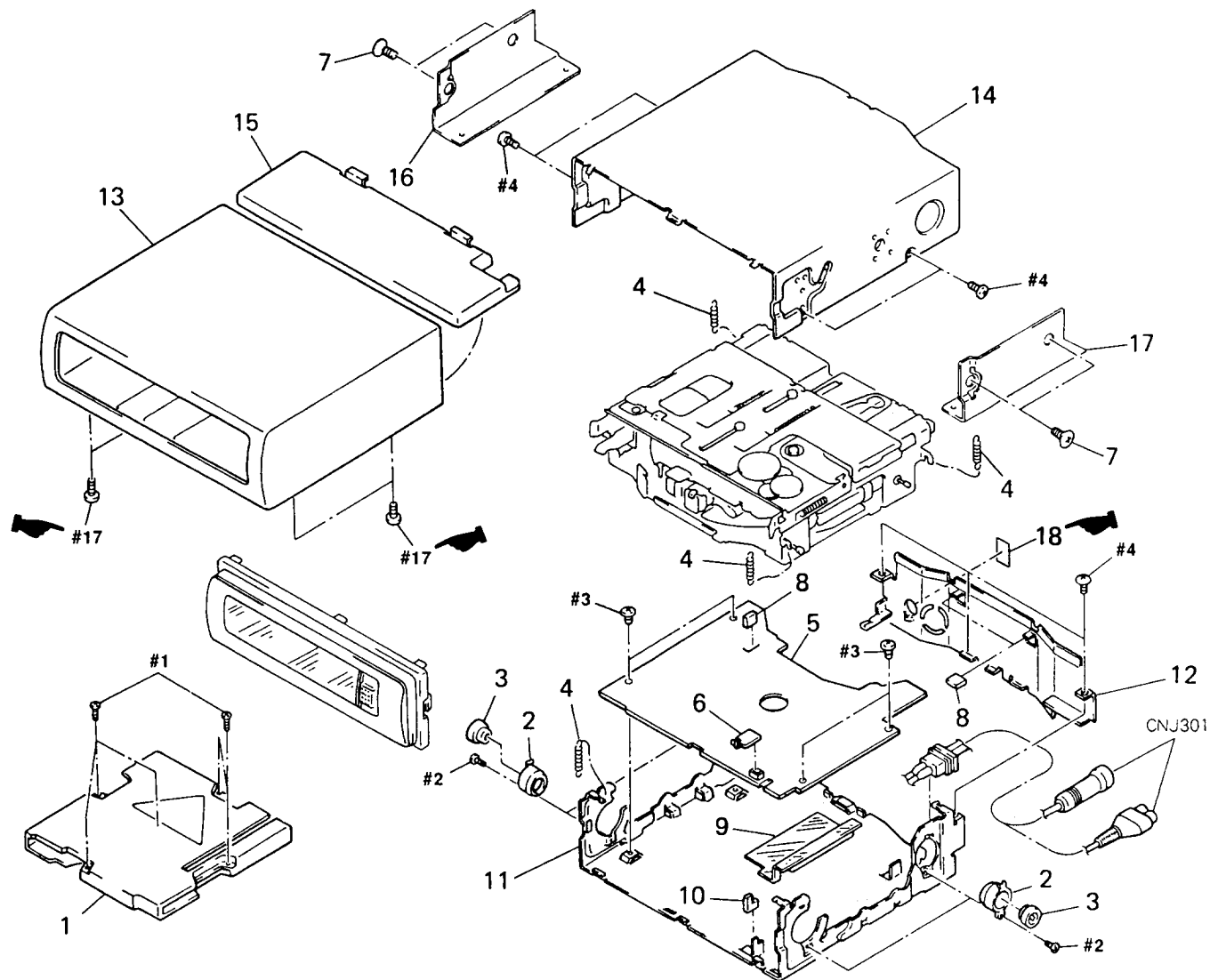
IC506 MPC1718FU



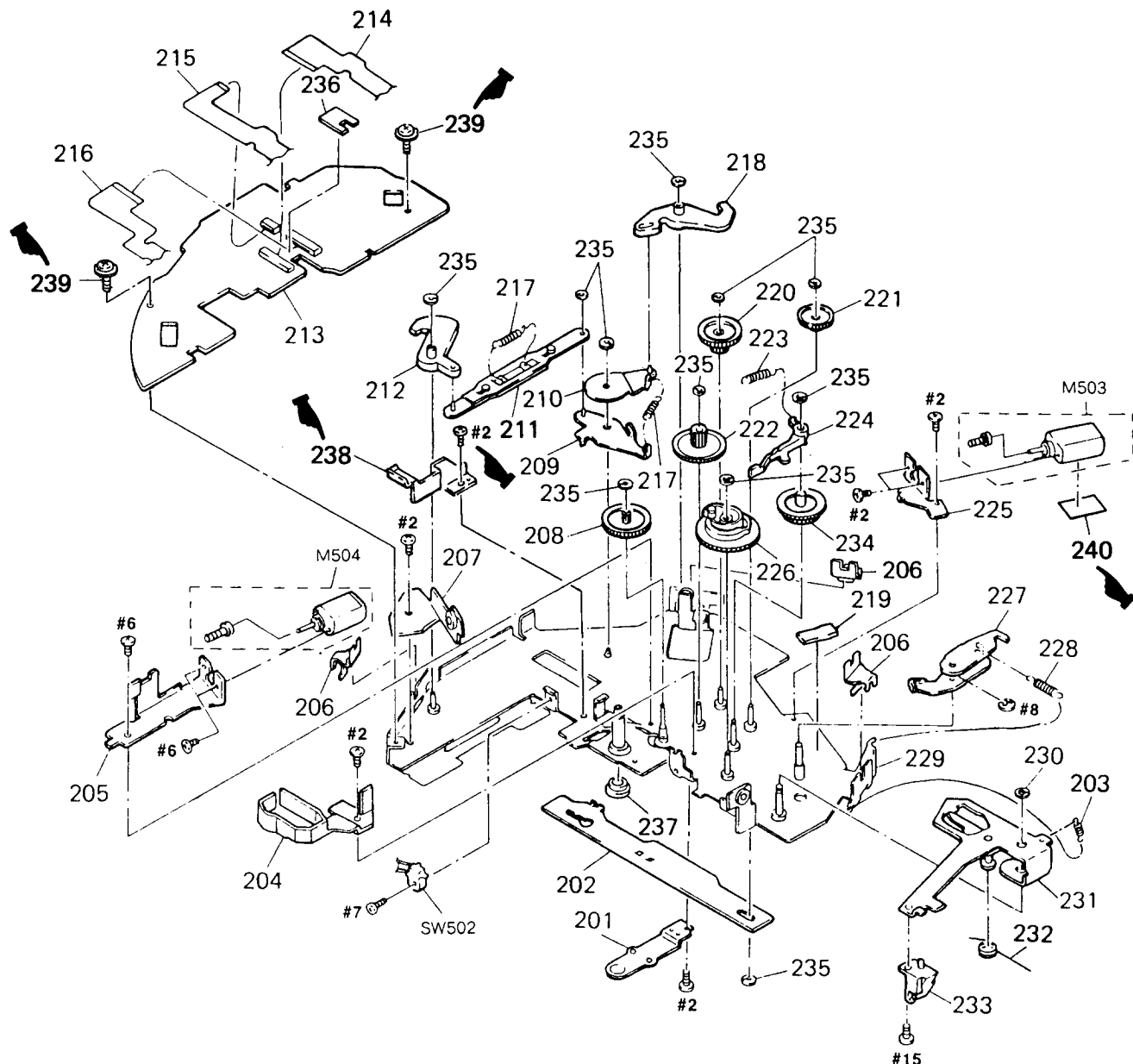
IC502, 503, 505 TC4S66F



### 3-1. HIDEAWAY SECTION



3-4. MD SECTION-2 (Service Manual See page 28)





● **ELECTRICAL PARTS LIST** (Service Manual See page 30 – 35)

## Former Parts

## New Parts

Ref. No.	Part No.	Description	Part No.	Description	Remarks
C312 (Page 30)	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	1-164-346-11	CERAMIC CHIP 1uF 10% 25V	Changed
C408 (Page 31)	_____		1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	Added
C409 (Page 31)	_____		1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	Added
* D327 (Page 31)	8-719-016-74	DIODE 1SS352	_____		Deleted
D328 (Page 31)	_____		8-719-988-62	DIODE 1SS355	Added
FB319 (Page 31)	1-216-295-00	METAL GLAZE 0 5% 1/10W	_____		Deleted
IC308 (Page 32)	8-759-096-18	IC MM1176XFF	8-759-284-87	IC MM1284XFFE	Changed
R339 (Page 33)	1-216-073-00	METAL CHIP 10K 5% 1/10W	1-216-097-00	METAL CHIP 100K 5% 1/10W	Changed
* R462 (Page 34)	1-216-083-00	METAL CHIP 27K 5% 1/10W	_____		Deleted
R463 (Page 34)	_____		1-216-295-91	METAL CHIP 0 5% 1/10W	Added
R501 (Page 35)	1-216-845-11	METAL CHIP 100K 5% 1/16W	1-216-841-11	METAL CHIP 47K 5% 1/16W	Changed
R503 (Page 35)	1-220-372-11	METAL CHIP 200K 5% 1/16W	1-216-848-11	METAL CHIP 180K 5% 1/16W	Changed
D504 (Page 35)	1-220-372-11	METAL CHIP 200K 5% 1/16W	1-216-848-11	METAL CHIP 180k 5% 1/16W	Changed

\* D327 and R462 are canceled only when IC308 uses MM1284XFFE.

● **ACCESSORIES & PACKING MATERIALS** (Service Manual See page 36)

## Former Parts

## New Parts

Ref. No.	Part No.	Description	Part No.	Description	Remarks
(Page 36)	3-915-909-01	SLEEVE	_____		Deleted